

Research Note

NEW RECORDS OF NATURAL ENEMIES OF THE PEPPER WEEVIL, *ANTHONOMUS EUGENII CANO* (COLEOPTERA: CURCULIONIDAE), IN PUERTO RICO^{1,2}

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J. Agric. Univ. P.R. 87(1-2):69-72 (2003)

The pepper weevil, *Anthonomus eugenii* Cano, is the most dangerous pest of pepper in Puerto Rico (Dept. of Agric., 1996). During the past years, heavy infestations of this insect have been reported throughout the major pepper growing areas of Puerto Rico (Correa-Galíndez, 1999; Dept. of Agric., 1996). Farmers regularly control this pest with insecticides, but effectiveness is variable (Armstrong, 1994; Schuster, 1995). In 1996, a survey of 53 farms in Puerto Rico on the impact of this insect in pepper revealed that more than 40% were infested with PW. Insecticides were commonly used to control pepper weevil. But even with the diversity of chemicals applied, in some cases no reduction of the infestation was observed (Dept. of Agric., 1996). Some information is available about natural enemies of pepper weevil, but none from Puerto Rico (McDonald, 1997).

The pepper weevil was first detected in Puerto Rico in 1982 (Abreu and Cruz, 1985). Since this pest's introduction, the most common control method has been the use of insecticides. No parasitoids have been reported in Puerto Rico since the introduction of the pepper weevil to the island and no attempt to conduct a survey of its natural enemies has been made. The objective of this research was to survey the natural enemies of the pepper weevil throughout the major producing areas of pepper in Puerto Rico. New information on the natural enemies of the pepper weevil in Puerto Rico can be useful in the development of a biological control program for this pest. Little is known about the potential control of the pepper weevil population with parasitoids.

Small fruits of pepper cv. Biscayne (≤ 2.5 cm in diameter) were collected from various infested pepper plots at the Agricultural Experiment Stations (AES) at Lajas and Isabela, and from infested commercial pepper fields in Cabo Rojo, Lajas, Guánica, Adjuntas, Santa Isabel, Barranquitas, and Naranjito from 1995 through 1998. Collected fruit sam-

¹Manuscript submitted to the Editorial Board 23 February 2001.

²This research was supported by the Agricultural Experiment Station of the University of Puerto Rico (Project Z-91) in collaboration with the Gulf Coast Research and Education Center, University of Florida, Bradenton (Project CBAG 95-05-1918). We want to acknowledge the collaboration of E. E. Grissel of the University of Arkansas and J. B. Whitfield of the Systematic Entomology Laboratory, USDA, for the identification of the parasitoids. We are also grateful to D. J. Schuster, Researcher, of the Gulf Coast Research and Education Center, Univ. of Florida, Bradenton, for collaboration in this project.

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ples were placed in plastic bags, kept inside a cooler, and transported to the laboratory. A total of 200 small fruits were collected per site per survey (100 picked from the plant and 100 picked from the ground). Fruits were dissected, and larvae, pupae and adults of the pepper weevil found inside the fruit were removed with feather forceps or a small camel hair brush. Larvae were reared individually on an artificial diet developed by Toba et al. (1969), whereas pupae and adults were kept separately individually in petri dishes. Insects were kept in the laboratory with a day:dark cycle of 14:10 h at a temperature of $\pm 22^{\circ}\text{C}$. Each specimen of the pepper weevil was monitored constantly for mortality and parasitoid emergence. Predators observed attacking the pepper weevil during the collection of fruits were collected with a sweep net at the localities visited. Parasitoids recovered were sent to J. Whitfield of the University of Arkansas in Fayetteville, Arkansas, and to E. E. Grissel of the Systematic Entomology Laboratory (SEL), USDA, in Beltsville, Maryland. Specimens were not returned to the principal author. Voucher specimens were deposited at the 'Museo de Entomología y Biodiversidad Tropical' of the Agricultural Experiment Station, University of Puerto Rico, Río Piedras.

An additional pepper field (1,600 pepper plants cv. Biscayne) was established at the Lajas AES in January 1998. A total of 200 flower buds per survey (100 from the plant and 100 from the ground) were collected. Flower buds collected were placed in plastic bags, deposited in a cooler, and taken to the laboratory. The flower buds were held in petri dishes and monitored weekly for pepper weevil or parasitoid emergence. Emerged parasitoids were sent to E. E. Grissel of the SEL, USDA.

Two parasitoid species were recovered from the larvae of *A. eugenii*, reared on an artificial diet, from pupae kept in petri dishes, and from small pepper fruits held in petri dishes (Table 1). Both species emerged from samples collected at Lajas. They were identified as *Catolaccus hunteri* Crawford (Hymenoptera: Pteromalidae)⁷ (two specimens) and *Urosigalphus mexicanus* Gibson (Hymenoptera: Braconidae)⁸ (one specimen) (Figures 1 and 2). This is the first report of these two species in Puerto Rico. *Catolaccus hunteri* was obtained in 1996 and 1998, with 0.28% and 3.39% parasitism of larvae collected, respectively. *Urosigalphus mexicanus* was recovered only during 1997 with 0.07% parasitism. *Catolaccus hunteri* has been reported as an effective parasitoid of the pepper weevil in Florida (USA) and in Mexico (Riley and Schuster, 1992). *Urosigalphus mexicanus* is considered a specific parasitoid of the pepper weevil in Mexico (McDonald, 1997). Cave (1995) indicates that *U. mexicanus* is an endoparasite of the larva of the pepper weevil.

TABLE 1.—Parasitoids of *Anthonomus eugenii* Cano in Puerto Rico, 1995 to 1998.

Order/family/genus	Instar parasitized	Locality
Hymenoptera		
Braconidae		
<i>Urosigalphus mexicanus</i> Gibson ¹	Larvae	Lajas
Pteromalidae		
<i>Catolaccus hunteri</i> Crawford ²	Larvae and Pupa	Lajas

¹P.R.#1-96 (one specimen).

²P.R.#1-97 (two specimens).

⁷*C. hunteri* was identified by E. E. Grissel, Taxonomist of the SEL, USDA.

⁸*U. mexicanus* was identified by J. B. Whitfield, Entomologist, Univ. of Arkansas in Fayetteville.

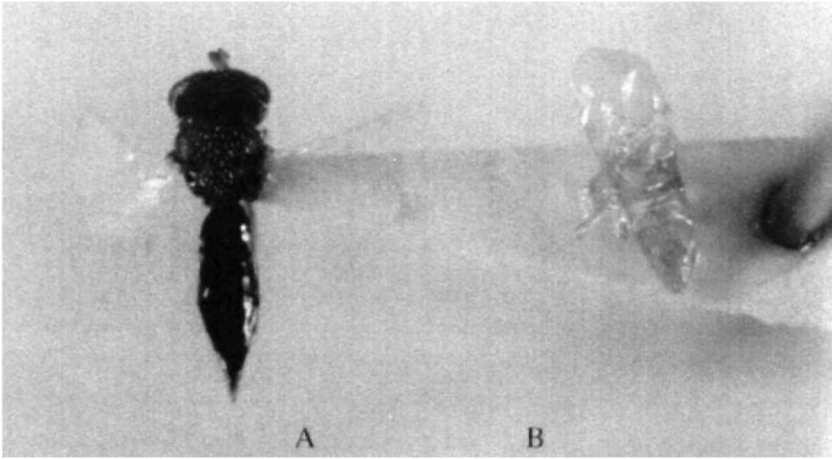


FIGURE 1. *Catolaccus hunteri* Crawford (Hymenoptera: Pteromalidae), parasitoid emerged from larvae of *A. eugenii* held in petri dishes with artificial diets.

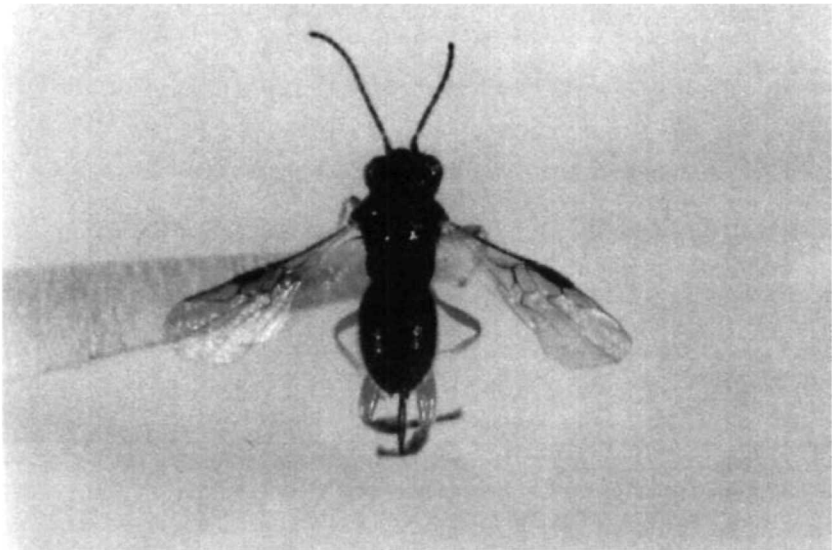


FIGURE 2. *Urosigalphus mexicanus* Gibson (Hymenoptera: Braconidae), parasitoid emerged from larvae of *A. eugenii* held in petri dishes with artificial diets.

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