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Nota científica

TECHNIQUE FOR OVIPOSITION OF THE PEPPER WEEVIL (COLEOPTERA: CURCULIONIDAE) TO OBTAIN MASSIVE COLONIES IN THE LABORATORY.

The feeding by larvae and adults of the pepper weevil (*Anthonomus eugenii* Cano) is the main limiting factor in the production of chili or hot peppers (*Capsicum annuum* L.) in southern USA, México, Central and South America (Riley, D.G., *et al.*, 1992. *J. Econ. Entomol.*, 85 (5): 1919-1925). This pest attacks flowers and fruits and causes serious damage in pepper fields (Cartwright, B. *et al.,* 1990. *J. Econ. Entomol.*, 83 (5):2003-2007).The losses in this crop have been extended for many years and exceeding 50% in under high infestation levels in some years (Quiñonez Pando, F.J.1993. SARH. INIFAP. CRINC, Pub. Esp. No. 1, 34 pp.).

In Mexico, the incidence of pepper weevils provokes an average of 15 applications of chemical insecticides per season, increasing the production costs, environmental pollution, phytotoxicity (Gliessman, S. R. 1997. Sleeping Bear Press. 351 pp.), as well as selection pressure for resistance in insect populations. Thus, this insect develops resistance to different groups of chemical insecticides. It is necessary to establish levels of the resistance to these insecticides. Constant bioassays with field populations and comparisons with those of susceptible population need to be made. However, there is difficulty maintaining an insecticide susceptible laboratory colony (López Terrones, M.E. 1996. M. Sc. Thesis. Colegio de Postgraduados). The main difficulty to obtain oviposition has been the lack of artificial substrates in the laboratory. Previous studies by Toba *et al.* (1969. *J. Econ. Entomol.*, 62 (1):257-258) and Coudriet and Kishava (1988. *J. Econ. Entomol.*, 81(5):1488-1502) have described how to breed the pepper weevil with artificial diets under laboratory conditions but without an adequate oviposition by females. Our objective was to establish a semiartificial technique that increases oviposition of the pepper weevil under laboratory conditions at reduced costs. We use the term "semiartificial" because the use of leaves from natural plants to create artificial fruits for oviposition.

This work was developed at the Center for Biological Research of Northwest Mexico (CIBNOR), 17 km west La Paz City, in the semiarid southern region of the Baja California Peninsula. The maximum (38.5 °C) and minimum (9.5 °C) temperature occurs in July and January respectively. Pepper fruits infested with pepper weevil larvae were collected in plastic 50-L boxes during 2000 from a commercial field of Todos Santos, Baja California Sur (located at 23° 23' N and 110° 09' W). The fruits were covered with organdy and kept. In this container the adults emerged 2-3 days later of each collect, we took 100 adults regardless the sex, and put them in a 30 x 30 x 30 cm cage (Fig. 1) with glass sides and the top covered with an organdy sleeve for a better manipulation.

The selected adults were supplied every four days with a honey solution (10%). Water was provided in a container with a cotton wick for

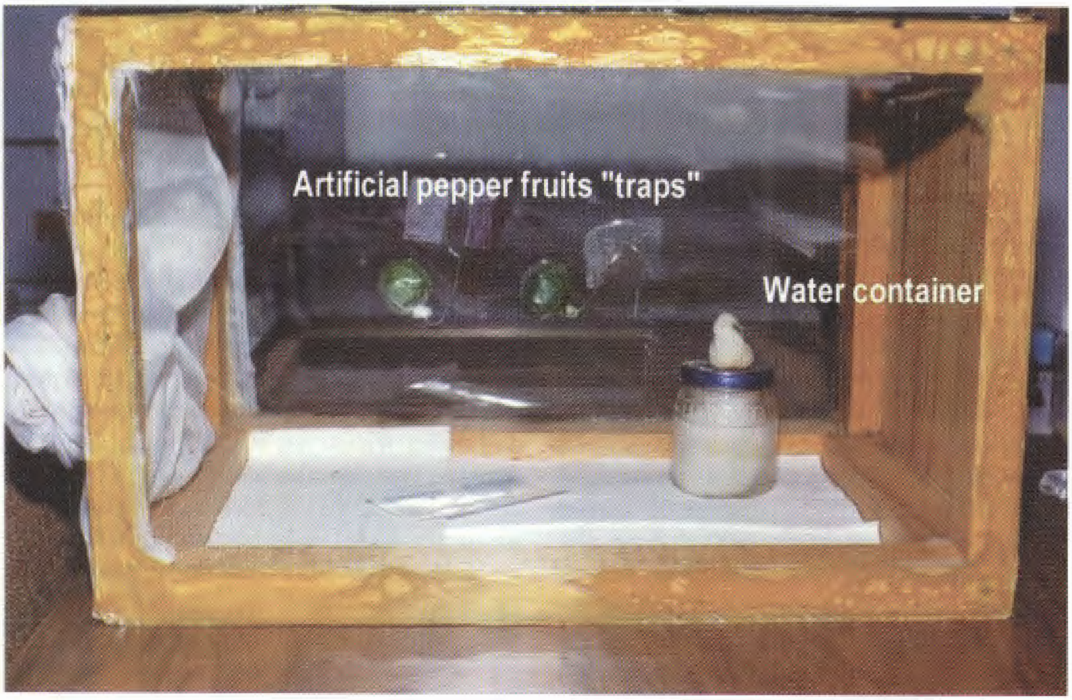

Figure 1. "Traps" of polyurethane spheres, pepper leaves and parafilm in a cage with honey to pepper weevil oviposition

an easy access by the insects. The temperature was maintained at about 27 °C. The traps for oviposition were 1-cm diameter polyurethane spheres covered with fresh pepper leaves washed in 1% sodium hypochlorite to avoid fungi growth and the excess moisture was removed with paper towels. We installed 7 cages with 5, 5, 10, 10, 10, 15, and 15 traps respectively. The prepared traps were covered with parafilm, then were hung from the wall and top of the cage.

The traps were checked every 24 hours by with drawing the cap of parafilm and carefully and slowly unfolding the leaves. The eggs found were put on split half fresh pepper fruit by using entomological tweezers. The fresh pepper was covered with parafilm, kept inside a container, and checked daily. We made a daily record of the observations for each natural fruit on which the eggs were deposited for hatching and larval development.

Immediately after the traps were hung in the cages the adults were placed inside. Upon withdrawing the parafilm, we verified the pepper weevils were feeding on the leaves making the characteristic perforations, confirming the presence of the eggs. Generally, eggs were laid near of the middle.

The average for hatching was two days. Was observed that 34 out of 50 eggs tolerate and emerged after a period of two days in refrigeration at 4 °C. We got an average of 18 eggs per trap for an average of 180 per cage. From the total number of eggs (1260), 38% reached the first larval instar (L_1), 27% the third instar (L_3), and 21% to get adult. The total percentage of eggs hatched was 67%. We got 68% of the eggs kept refrigerated to avoid drying out to hatch. 50 insects placed into the cage were kept until they died, the last one dying 35 days later.

In this experiment, most eggs were deposited when the females had been kept for 15 to 20 days. More days caused a decrease in the number of ovipositions. We suggest that this methodology is an efficient tool to do massive colonies of pepper weevil in the laboratory. More research should be made, specially this technique in combination with different diets.

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