SCIENTIFIC NOTES

EFFECT OF BAIT DECOMPOSITION TIME ON CAPTURE OF *ANASTREPHA* FRUIT FLIES

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Some *Anastrepha* species are ranked as the most economically important insect pests in Mexico, Central and South America. McPhail traps are currently used in detection and survey activities in these countries. However their low efficiency and high variability are well known (Liedo 1983, Aluja et al. 1989). In order to elucidate some of the causes of variability of these traps, the effect of bait decomposition time on the number of flies captured in the traps, was investigated.

Field trials were carried out in a non-commercial mixed fruit area in the Mazapa de Madero Valley, Chiapas, Mexico, located at an altitude of 1,020 m above sea level, which is considered an ecological zone isolated by mountains, and where data on the dynamics were available. The tests were done in late July, when traps captures are normally at their peak (Aluja et al. 1989).

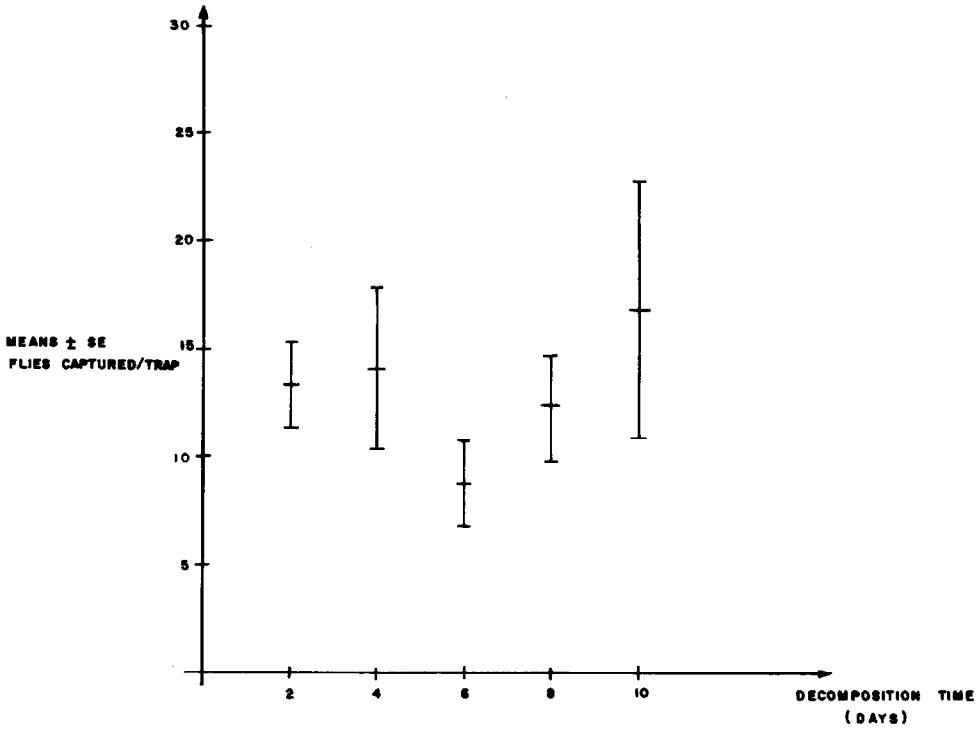
Traps were baited with a mixture of torula yeast and borax in a ratio of 4:5 (21 g) made up to 500 ml with water (Lopez et al. 1971). This mixture was held (27 ± 3° C) for decomposition in plastic containers covered with a fine cloth to exclude insects.

Thirty McPahil traps were set using baits after 2, 4, 6, 8, and 10 days of decomposition, with six traps for each decomposition time. All treatments were tested simultaneously. The experiment was replicated five times.

Traps were hung in mango trees, *Mangifera indica* L. variety "criollo", also known as "mango de coche", that had mature fruits. The distance between traps was a minimum of 120 m. The baited traps were put on the trees at 06:00 hours and collected 24 h later. Captured flies were counted and identified using the key produced by Steyskal (1977). The traps were washed before being used again. A total of 1,939 *Anastrepha* fruit flies were captured. The relative abundance of each species was: *Anastrepha ludens* (66.5 %), *Anastrepha obliqua* (31.6 %), *Anastrepha serpentina* (1.5 %), *Anastrepha distincta* (0.02 %), and *Anastrepha fraterculus* (0.05 %). The sum of *A. ludens* and *A. obliqua* caught was 98.1% of the total captured flies. These results are similar to those reported by Rios et al. (1986) who found that *A. ludens*, *A. obliqua*, and *A. serpentina* were the predominant species in this valley.

For all treatments more females (1371) than males (568) of *Anastrepha* fruit flies were captured. This male:female ratio of about 2.4:1 was found for both (*A. ludens* and *A. obliqua*), also. These results confirmed the previous reports indicating that McPhail traps baited with a proteinaceous attractant capture more *Anastrepha* females than males. This is presumably because the females require the protein for ovarian development and sexual maturation (Houston 1981, Aluja et al. 1989, Mason & Baranowski 1989). McPhail (1937), in a study using fermented sugars as bait, reported that more males than females of *A. judens* were captured in McPhail traps. This suggests that volatiles produced by sugar fermentation differ from those produced by protein baits.

Fig. 1 shows the mean (± SE) number of *Anastrepha* fruit flies captured as a function of the decomposition time. There were no significant differences between treatments ($P > 0.05$). Nevertheless the highest catch was obtained with the baits that had ten



days of decomposition, and the least number of *Anastrepha* was obtained with baits with six days of decomposition time. This suggest that during the decomposition process, compounds are forming that are responsable for the attraction. Perhaps ammonia is not the only volatile compound which affects the behavior of the flies (Mazor et al. 1987).

In another experiment examining different decomposition times (7, 15, 18, 21, 24, and 27 days), G. Zapien-Herrera (personal communication) found similar results in recapturing released sterilized Mediterranean fruit flies. However, she captured more males than females in a ratio of 1.18:1. It is generally accepted that ammonia production accompanies protein breakdown. Glutamine and asparagine, which are common constituents of natural proteins, including the yeast baits used here, both produce ammonia during hydrolysis to the respective acids (Bateman & Morton 1981, Morton & Bateman 1981).

Generally the McPhail traps used in control programs are renewed every seven days. The findings reported here demonstrate that within this decompostion time the bait is a poor attractant.

I thank J. L. Nation Department of Entomology and Nematology Department, University of Florida), and J. Valenzuela and G. Zapien (CIES) for helpful comments on the manuscript. Technical assistance was provided by Rufino Vargas, Alvaro Garcia and Miguel A. Guzman.

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ELECTRONIC RELEASE DEVICE FOR FLIGHT TUNNEL BIOASSAYS

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Research on the effects of sex pheromones and other semiochemicals on insect behavior often is conducted in the laboratory using wind tunnels of various dimensions constructed of clear plexiglas through which is passed a stream of air. Test insects generally are released individually from open containers or from a small, manually-operated release cage positioned downwind of a potential stimulus source. Behavioral response data generally are recorded in one or a combination of ways including dictation to a tape recorder; video recordings; hand-operated stop watches; and, for timed event recordings, on a portable computer.

Described here is a small, electronically-operated insect release cage that facilitates timed recordings of various behavioral response parameters in wind tunnel assays. The