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ACOUSTICAL OVIPOSITION CUES IN THE CARIBBEAN FRUIT FLY, *ANASTREPHA SUSPENSA* (DIPTERA: TEPHRITIDAE)

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Ovipositing fruit flies insert their eggs into closed environments that could harbor unseen conspecific and heterospecific competitors. The evolution of marking (oviposition deterring) pheromones in several tephritid genera, including *Anastrepha*, reflects widespread selection to avoid these hidden rivals (Prokopy et al. 1977). Such markers are of limited use since they deteriorate over a period of days or less. However, several female fruit flies are able to distinguish larva-bearing fruit in the absence of a pheromone. For example, in *Dacus tryoni* (Froggatt) females avoid laying eggs in pulp inhabited by larvae even after larvae are removed, presumably by sensing chemical traces of occupancy (Fitt 1984). Another potential cue to larval presence is the sounds they make as they move and feed (as suggested by Fitt 1984). These sounds can be surprisingly loud. Late-instar Caribbean fruit fly larvae in a grapefruit can be heard by some people with the unaided ear. Also able to hear maggots in fruit is the caribfly parasite *Biosteres longicaudatus* Ashmead that locates its hosts through their feeding sounds and movements (Lawrence 1981, see also Glas and Vet 1983). Evidence is presented below that female *A. suspensa* (Loew) distinguish larval feeding sounds/vibrations and are less likely to oviposit where these sounds are present.

The peak sound pressure level of the feeding sounds of multiple late-instar larvae reaching the surface of infested grapefruit was determined by placing directly against the fruits a 25-mm Brüel & Kjaer (B&K) Model 4145® condensor microphone coupled to a B&K 2610 amplifier. An endless loop recording of feeding sounds was then broadcast from an earphone at a similar level (45-50 dB, OdB re 20 μpa at the surface). Over this earphone and an identical, but silent one, were placed wax oviposition domes (diam

57 mm) that contained moistened cotton wicks. These domed earphones were then placed in a 30 cm x 30 cm x 30 cm plexiglass cage. Five mated female flies, either taken from the field as larvae or after a single laboratory generation, were put into the cage along with food and water. After 24 h, the flies were removed and eggs on the domes counted. Twenty replicates were made and the positions of the experimental and control earphones were reversed with every replicate.

In 16 of the 20 trials, females laid more eggs on the silent, wax dome ($\bar{x}$ 1.6 egg/female/day on broadcast dome *vs.* $\bar{x}$ 3.5 on control; s = 2.0 *vs.* 3.6; Wilcoxon paired T test, $P < 0.0005$).

This is not the only case of an adult insect that apparently perceives tephritid larvae through sound. As noted, a number of parasites use vibration to locate hosts (Lawrence 1981, Glas and Vet 1983, Lathrop and Newton 1933, Nishida 1956). The relative importance of larval sound as a cue to ovipositing fruit flies is unknown. Such sounds or even larval presence are not necessary to dissuade female *D. tryoni* from ovipositing in once occupied fruit. Perhaps sound is but one of a number of cues an ovipositing fly uses in finding a suitable environment for its offspring.

This article reports the results of research only. Mention of a proprietary product does not constitute an endorsement or the recommendation for its use by USDA.

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