

## Acoustical Location of Calling Frogs by Philander Opossums

Although biologists have long suspected that predators might orient to the sounds of prey mating calls (Lutz 1924), documentation is rare and exists only for crickets (Walker 1964, Bell 1979). In the period 27 February to 27 April 1980, we observed a breeding chorus (averaged 153 per night, range, 5-425) of the small leptodactylid frog, *Physalaemus pustulosus*, at the Weir Pond, Barro Colorado Island, Panama.

A Javelin Model 221 night vision scope was used to observe predators, including philander opossums (*Philander opossum*), at distances of 2-4 m. We observed the pond for a total of 37 hrs. on 19 nights between 1830 and 2400 hrs., averaging 2 hrs./night.

Philander opossums were present 5.4 percent of the time between 1900 and 2400 hrs., and 39 captures of *P. pustulosus* were observed. The mean capture rate of 1.1 frogs/hr. of observation time (range, 0.0-4.4) indicated average before-midnight-catches of approximately six frogs. Since we often were distracted by observations of other predators, this is a minimum estimate.

Approaching opossums frequently stopped near the edge of the pond, listened briefly, then turned in the direction of calling *P. pustulosus*. At a distance of 1-2 m they often paused again, turning their heads slightly from side to side and rotated their ears back and forth, before rushing forward to attempt a capture. This behavior was especially apparent when only a few frogs were calling.

We suspected that opossums were locating individual calling frogs acoustically. To test this hypothesis, we recorded *P. pustulosus* advertisement calls (1 whine plus 3 chucks each) for playback, then hid a remote-controlled Olympus Pearlcorde, Model D120, 2 m from the pond's edge at a place not normally visited by opossums. When a hunting philander opossum was sighted, we waited till few or no frogs were calling and the opossum was headed away from the speaker before activating the recorder.

In each of five trials the opossum immediately turned and approached the recorded call. In three trials the opossum pounced on the speaker, and in the other two our nearby presence frightened the opossum away after it had approached to within less than 1 m. Opossums were attracted from distances of 5, 4, 4, 3, and 1.5 m.

Responding opossums exhibited apparent listening behavior during their approaches. For example, the first opossum immediately turned toward the speaker, rose on its hind legs, turned its head slightly from side to side while rotating its ears back and forth, then ran to and pounced on the speaker, circling it thereafter at a distance of about 10 cm until the speaker was turned off.

Philander opossums hunted even on nights when it was impossible to form an image in our night-vision scope without an infrared light source. Langley (1979) already has shown that captive Virginia opossums (*Didelphis marsupialis*) prefer auditory over visual cues when finding crickets. Since *P. pustulosus* is only 3.5 cm in length and highly cryptic, hunting philander opossums likely depend heavily on acoustical cues.

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