Bats: What sounds good doesn't always taste good

May 21 2012

Bats use a combination of cues in their hunting sequence - capture, handling and consumption - to decide which prey to attack, catch and consume and which ones they are better off leaving alone or dropping mid-way through the hunt. Eavesdropping bats first listen to their prey, then they assess its size, and finally they taste it. The work by Dr. Rachel Page and her team from the Smithsonian Tropical Research Institute in Panama is published online in Springer's journal *Naturwissenschaften - The Science of Nature*.

To survive, predators must find prey that is both of the right size and edible. To accomplish this goal, predators often use multiple sensory cues to detect and assess prey. Page and colleagues' experiments show that the fringe-lipped bat, Trachops cirrhosus, which feeds on a variety of prey including frogs, uses acoustic cues from a distance first. Then

the bat fine tunes its hunting strategy at close range by assessing the prey's size, likely by echolocation, and finally tastes it by using chemical cues. It sequentially re-assesses the suitability of its prey throughout the hunt.

The researchers studied eight bats on Barro Colorado Island in Panama. They investigated whether the bats update information about their prey to minimize potentially lethal errors. They used the calls of a palatable species of frog to encourage the bats to approach prey frogs. Then they offered the bats a combination of unmanipulated prey and prey with toxins that are potentially lethal if ingested: the bats' preferred prey species (the túngara frog) and two poisonous toads (the large cane toad and the small leaf litter toad).

The calls elicited an attack response but as the bats approached, they used additional cues in a sequential manner to update their information about prey size and palatability. Both palatable and poisonous small frogs were captured, whereas large poisonous toads were approached but left alone. This suggests that the bats assessed the prey size at close range first and thus only captured those frogs and toads of appropriate size for them to handle.

Once the bats had captured their prey, they used chemical cues to make final, post-capture decisions about whether or not to consume the prey. Indeed, they dropped small, poisonous toads as well as palatable frogs coated in toad toxins either immediately or shortly after capture.

These findings suggest that echolocation and chemical cues obtained at close range supplemented information obtained from acoustic cues at long range.

The authors conclude: "Our study demonstrates that following initial assessment of prey, bats have the ability to use alternate sensory

modalities to sequentially reassess prey at close range, and thus compensate for potentially deadly errors. Our results bring to light the sequential, complex nature of prey assessment foraging strategies that may allow exploratory and flexible hunting behaviors."

More information: Page RA et al (2012). Sequential assessment of prey through the use of multiple sensory cues by an eavesdropping bat. *Naturwissenschaften - The Science of Nature*; DOI 10.1007/s00114-012-0920-6

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