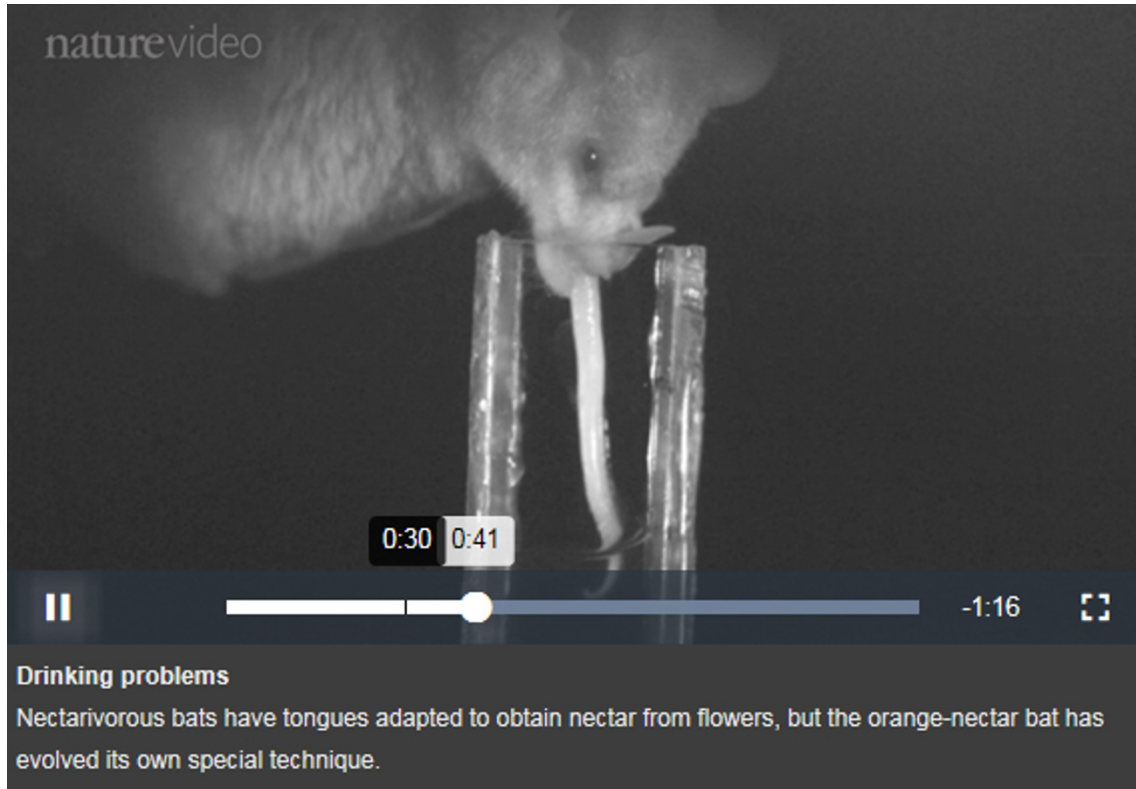


Bat drinks using 'tongue-pump' trick

Unique mechanism is an alternative to lapping up liquid.

Emma Brown

25 September 2015



By focussing a high-speed camera on a test tube filled with nectar, researchers have observed bats using a tongue-pumping stratagem that has never before been seen in mammals.

The footage showed how the orange-nectar bat (*Lonchophylla robusta*) drinks 150% of its body weight each night, yet its tongue barely seems to move as it slurps liquid from a flower.

Most vertebrates — including some other bats — drink by lapping liquid up. But the tip of the orange-nectar bat's tongue stays submerged below the nectar's surface while the creature hovers above a flower. And while other bats have tongues with hair-like papillae (tiny bobbles), the tongue of the orange-nectar bat does not. Instead, it has two open grooves that run along its left and right sides, explains ecologist Marco Tschapka of the University of Ulm, Germany, a co-author of the study, published on 25 September in *Science Advances*¹. Tiny, pump-like muscles push nectar up the two grooves, or 'canals', and into the mouth. The researchers suspect that some sort of capillary action prevents the nectar from spilling out of the canals as pumping occurs.

Groovy creatures

Hummingbirds also use grooved tongues to feed on nectar. The forked tips of their tongues force nectar into the channels, after which the tongue retracts, the channels compress and the liquid is pushed upwards².

Tschapka speculates that the lapping mechanism is optimal for collecting individual droplets of nectar, whereas a pumping tongue could have easier access to deep pools.

"Bats in general have some of the most bizarre morphological adaptations — from leaf-nosed bats to wrinkle-faced to sucker-footed — so this seems to be just another one of those really interesting and strange adaptations," says Brian Hickey, a biologist at the St

Lawrence River Institute of Environmental Sciences in the city of Cornwall, Canada.

Nature | doi:10.1038/nature.2015.18434

References

1. Tschapka, M., Gonzalez-Terrazas, T. P., Knornschild, M. *Sci. Adv.* <http://dx.doi.org/10.1126/sciadv.1500525> (2015).
2. Rico-Guevara, A., Fan, T.-H., Rubega, M. A. *Proc. R. Soc. B.* **282**, 20151014 (2015).