Bats use ear trumpets for social calls

Mammals roost in megaphone-shaped leaves that amplify calls from friends.

Brian Owens

16 October 2013



Spix's disc-winged bats can phone home effectively thanks to their tubular-shaped nests.

Bats that nest inside curled-up leaves may be getting an extra benefit from their homes: the tubular roosts act as acoustic horns, amplifying the social calls that the mammals use to keep their close-knit family groups together.

South American Spix's disc-winged bats (*Thyroptera tricolor*) roost in groups of five or six inside unfurling *Heliconia* and *Calathea* leaves. The leaves remain curled up for only about 24 hours, so the bats have to find new homes almost every day, and have highly specialized social calls to help groups stay together. When out flying, they emit a simple inquiry call. Bats inside leaves answer with a more complex response call to let group members know where the roost is.

Gloriana Chaverri, a biologist at the University of Costa Rica in Golfito, took curled leaves into the lab and played recorded bat calls through them, to see how the acoustics were changed by the tapered tubular shape of the leaves.

"The call emitted by flying bats got really amplified," she says, "while the calls from inside the leaves were not amplified as much."

Sound system

The inquiry calls from outside the roost were boosted by as much as 10 decibels as the sound waves were compressed while moving down the narrowing tube — the same thing that happens in an amplifying ear trumpet. Most response calls from inside the leaf were boosted by only 1–2 decibels, but the megaphone shape of the leaf made them highly directional. The results are published today in *Proceedings of the Royal Society B*¹.

Although flying bats almost always recognize their group members' response calls and pick out the correct roost to enter, bats inside a leaf seem unable to distinguish between the inquiry calls of friends and strangers. Chaverri says that the leaf nests distort incoming calls, which could be the cause of the confusion.

Terry Derting, a biologist at Murray State University in Kentucky, points out that because the experiment used recorded calls in a lab setting, any conclusions are "strictly hypothetical". Chaverri acknowledges that point, and hopes to do further studies to determine whether the bats are selecting roosts with beneficial acoustics.

Nature | doi:10.1038/nature.2013.13960

References

1. Chaverri, G. & Gillam, E. H. Proc. R. Soc. B http://dx.doi.org/10.1098/rspb.2013.2362 (2013).

Nature ISSN 0028-0836 ESSN 1476-4687

SPRINGER NATURE

© 2019 Macmillan Rublishers Limited, part of Springer Nature. All Rights Reserved. partner of AGORA, HINARI, OARE, INASP, CrossRef and COUNTER