Patterns of ultrasonic echolocation pulses in a bush-climbing rodent species with reduced eyes

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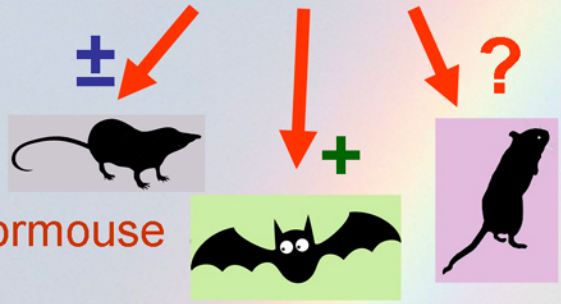
Ultrasonic echolocation in small mammals



Vietnamese pygmy dormouse
Typhlomys chapensis

Experiments

Two adult males

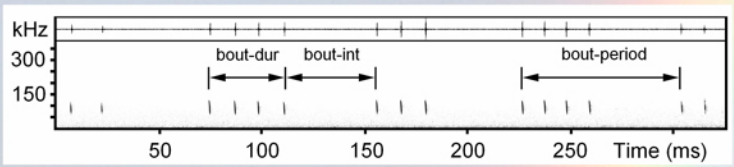
13 trials (7 & 6 per male), each 2-12 min

Audio records with Pettersson D 1000X (768 kHz, 16 bit)

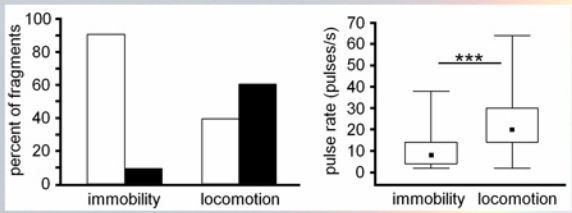
Total 62 min of audio recordings (30 & 32 min per male)

Spectrographic analysis of 1481 bouts and 540 ultrasonic pulses (325 & 215 per male) from 234 high-quality bouts

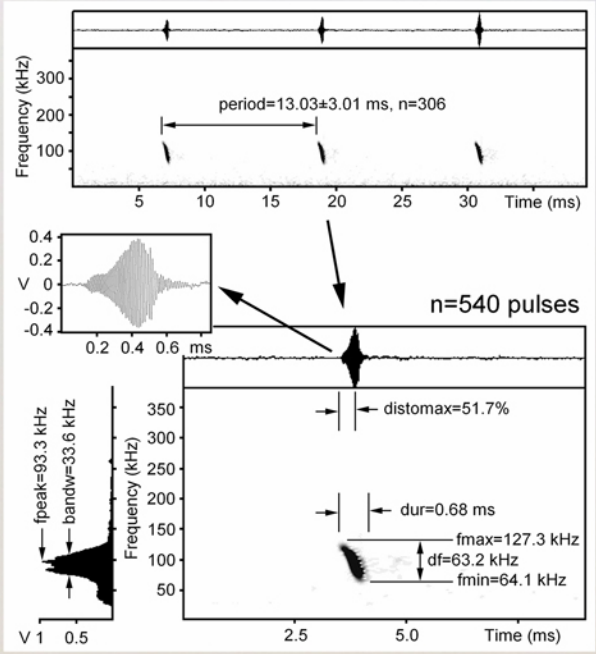
Structure of ultrasonic vocalizations of *Typhlomys chapensis*



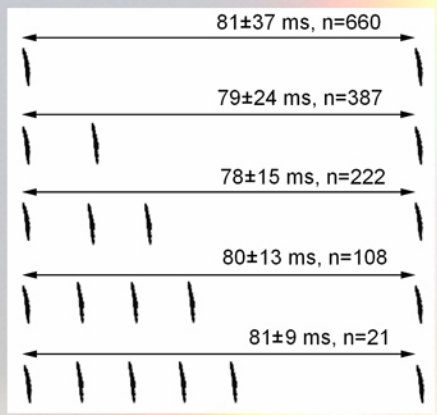
Echolocation pulses are organized in bouts and further in series, separated with intervals over 0.3 s. Bouts consist of 1-6 pulses; 51.3% of bouts contain more than one pulse.



Animals emit US pulses 6 times more often at locomotion than at rest. During vocalizing, pulse rate is 2 times higher at locomotion than at rest.

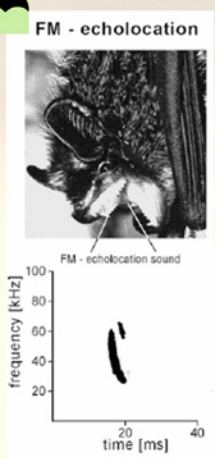


Pulses of single-pulse bouts and start pulses of multi-pulse bouts were lower fmax and less df than other pulses, whereas all other pulses within bouts were undistinguishable from each other. Duration, fmin, fpeak, bandw were independent on pulse position within bout.



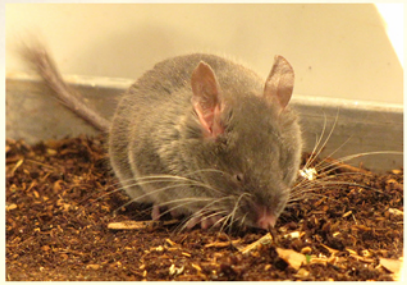
Bout period was constant (80.0±2.9 ms) in spite of the number of pulses per bout.

Rodent *vs* bat ultrasonic calls



The dormice ultrasonic pulses are remarkable similar with FM echolocation calls of *Myotis* bats. However, in *Myotis*, the pulses are lower in frequency, longer and louder and have not convex but concave contour.

9 *Myotis* species:
fmax: 81-113 kHz
fmin: 14-36 kHz
fpeak: 37-55 kHz
dur: 3.3-6.0 ms
(Obrist et al. 2004)



Integrative Zoology 2017; 12: 172–184 doi: 10.1111/1749-4877.12249

ORIGINAL ARTICLE

A blind climber: The first evidence of ultrasonic echolocation in arboreal mammals

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Support: Russian Science Foundation, grant 14-14-00237