

I am treefrog, feel me shake (w/ Video)

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Using experiments involving a mechanical shaker and a robotic frog, researchers reporting online on May 20th in *Current Biology* have found new evidence that male red-eyed treefrogs communicate with one another in aggressive contests by using vibrations they send through their plant perches. The findings open the door to further study of what has been a neglected channel for vertebrate communication.

"In the case of red-eyed treefrogs, tremulation displays in which the frogs shake their entire bodies convey information about the status and aggressive intent of the signaler," says Michael Caldwell of Boston University. "They also appear to carry information about the size of the signaler."

Earlier studies recognized the importance of vibrational signals for arthropod communication. Scientists had their suspicions that vertebrates on plants or in trees might rely on vibrational signals to communicate, too, but it had not been experimentally demonstrated until now.

In a series of playback experiments conducted at the Smithsonian Tropical Research Institute in Panama, the researchers found that plant-borne vibrations generated by the shaking display of male red-eyed treefrogs (*Agalychnis callidryas*) act as a signal and are both necessary and sufficient to elicit tremulations by other treefrogs in response. The frogs also tend to become more aggressive during visual playbacks, the researchers say, suggesting that both components of the signal may be important.

In male-male contests, tremulations were the most frequent aggressive display, and their use and vibrational characteristics varied with male size and depending on the context. The researchers say it now appears that most of the treefrogs' other signaling behaviors, including their acoustic calls, also generate strong and stereotyped vibrations that travel through plants and might carry information.

Caldwell explains that, although common, the frogs' behavior had likely been missed because of the tendency of human researchers to overlook vibrational signals, and because the treefrogs don't act normal under white light. "When we attached vibration-sensitive accelerometers to the plants and looked at the frogs under infrared light, we saw a whole new range of fascinating behaviors," he said.

The findings in treefrogs are likely applicable to other arboreal vertebrates, such as other frogs, lizards, birds, and primates, the researcher say. "Studies on frogs, birds, and primates have formed the core of our understanding of vertebrate communication," the researchers write, "yet we know almost nothing about vibrational signaling in these species. The further study of vibrational communication among arboreal vertebrates presents important unexplored opportunities to improve our comprehension of the behavioral ecology of these species, and of animal communication as a whole."

More information: Caldwell et al.: “Vibrational Signaling in the Agonistic Interactions of Red-Eyed Treefrogs.” Publishing in Current Biology 20, 1-6, June 8, 2010. [DOI 10.1016/j.cub.2010.03.069](https://doi.org/10.1016/j.cub.2010.03.069)

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