



National Center for Voice and Speech

A Cross-institutional consortium of voice and speech professionals

Ingo R. Titze, Executive Director

For Immediate Release

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**FROM BASS TO SOPRANO – ALL WITH ONE AND THE SAME VOCAL ORGAN
A computer model of the elk vocal organ suggests at high pitches you get
more bang for your buck.**

SALT LAKE CITY, August 23, 2010— The very different mating calls of the European red deer (*Cervus elaphus scoticus*) and the Rocky Mountain elk (*Cervus elaphus nelsoni*) have long puzzled naturalists, hunters and researchers. The National Center for Voice and Speech has recently discovered that the enormous pitch difference of the Cervus mating calls are also associated with differences in efficiency. The findings of this project were funded through the National Institute on Deafness and Other Communications Disorders and published online by the Public Library Of Science (PLOS).

The dichotomy between low frequency and high frequency calls for vocal signaling of male characteristics is rarely so dramatic as in these two closely related cervid species: During the mating season, one species is recognizable by a low frequency roar, while the other is well-known for its high frequency bugle. Mating calls provide information about a male's body size or physical strength and can therefore have important implications for its physiology, ecology, fecundity, or its aggressive interactions, or its mating success.

The current investigation uses a finite element model of vocal fold tissue vibration on the basis of morphological and biomechanical features of the Rocky Mountain elk vocal organs. Operating within reasonable physiological parameter ranges, the model allows the investigation of sound production efficiency as well as important physiological parameters. The model can produce sounds resembling the key features of mating calls from both species.

“Studying the physiology of sound production is difficult in many mammals. For example many animals do not vocalize when handled or it is impractical to keep them in the lab. The current computer model can be adapted to other mammal species using only landmark anatomical and biomechanical features. The sound simulations (which proved to be very close to natural vocalizations) can also serve as playbacks for perception studies investigating the role of vocalizations in communication,” said, Dr. Tobias Riede co-author on this article.

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This study developed by Dr. Ingo R. Titze and Dr. Tobias Riede opens a new frontier for studying the broader interest of mammal vocal folds. It helps to identify and quantify the challenges of producing sounds at high and low pitches as well as at high and low sound pressure levels. To read or download this article in its entirety go online to:

<http://www.ploscompbiol.org/article/info:doi/10.1371/journal.pcbi.1000897>

About the National Center for Voice and Speech

The National Center for Voice and Speech conducts research, educates vocologists, disseminates information about voice and speech, and provides referral services in order to help people around the world enjoy healthy and effective vocal communications.

The National Center for Voice and Speech - Giving Voice to America

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