

Koalas' low-pitched voice explained by unique organ

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This is a koala at Cape Otway. Credit: Benjamin Charlton

The pitch of male koalas' mating calls is about 20 times lower than it should be, given the Australian marsupial's relatively small size. Now,

researchers reporting in the Cell Press journal *Current Biology* on December 2 have discovered their secret: koalas have a specialized sound-producing organ that has never before been seen in any other land-dwelling mammal. The key feature of this newly described organ is its location outside the voice box, what scientists call the larynx.

"We have discovered that [koalas](#) possess an extra pair of vocal folds that are located outside the [larynx](#), where the oral and nasal cavities connect," says Benjamin Charlton of the University of Sussex. "We also demonstrated that koalas use these additional vocal folds to produce their extremely low-pitched mating calls."

The koala's bellow calls are produced as a continuous series of sounds on inhalation and exhalation, similar to a donkey's braying, Charlton explains. On inhalation, koala bellows sound a bit like snoring. As the animals exhale, the sound is more reminiscent of belching. And, as Charlton says, "they are actually quite loud."

They are also incredibly low-pitched, more typical of an animal the size of an elephant. Size is related to pitch in that the dimensions of the laryngeal vocal folds normally constrain the lowest frequency that an animal can generate. As a result, smaller species will typically give calls with higher frequencies than larger ones.

Koalas have bypassed that constraint by putting those vocal folds in a new location. Charlton describes the folds as two long, fleshy lips in the soft palette, just above the larynx at the junction between the oral and [nasal cavities](#). They may not look all that different from the laryngeal [vocal folds](#) of other mammals, but their location is highly unusual.

"To our knowledge, the only other example of a specialized sound-producing organ in mammals that is independent of the larynx are the phonic lips that toothed whales use to generate echolocation clicks,"

Charlton says.

The combination of morphological, video, and acoustic data in the new study represents the first evidence in a terrestrial mammal of an organ other than the larynx that is dedicated to sound production. Charlton says that he and his colleagues will now look more closely at other mammals to find out whether this vocal adaptation is truly unique to koalas.

More information: *Current Biology*, Charlton et al.: "Koalas use a novel vocal organ to produce unusually low-pitched mating calls"

Provided by Cell Press

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