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Crested Duck-Billed Dinosaurs Used "Caller ID"?

Ker Than for National Geographic News October 17, 2008

The bony crests that straddled the heads of some duck-billed dinosaurs may have been used to produce deep, haunting bellows, according to new research.

Medical scans of the dinos' nasal passages suggest that—like human teenagers—the animals' voices may have changed as they aged, and that the dinos had the ability to recognize individuals based on their voices alone.



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Duck-billed dinosaurs known as lambeosaurs lived 85 to 65 million years ago during the late Cretaceous period.

(Related: "Giant Duck-Billed Dino Discovered in Mexico" [February 12, 2008].)

Their often elaborate bony head crests contained long and looping nasal passages whose functions have been debated for decades.

For example, the crests have been proposed to act as communication tools, brain coolers, smelling enhancers—and even snorkels.

The new study, presented this week at the annual meeting of the Society of Vertebrate Paleontology in Cleveland, Ohio, supports the theory that the dinos used their crests to communicate via low-frequency calls.

"More and more evidence is mounting for this kind of behavior," noted Terry Gates, a paleontologist at the Utah Museum of Natural History who was not involved in the study.

But until now evidence for whether the lambeosaurs could hear such calls remained a missing part of the picture.

"It doesn't matter if they could make the calls if [their ears] couldn't pick them up," Gates

said.

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In the new study, scientists from three U.S. and Canadian universities used medical CT scans to create digital reconstructions from fossils of the brains and crest cavities of four different lambeosaur species.

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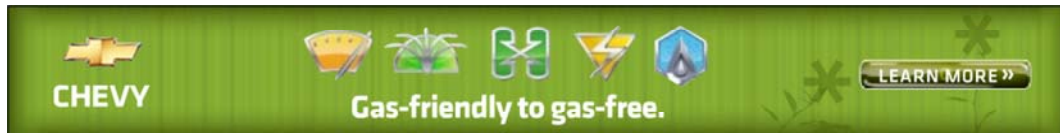
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<< Back to Page 1 Page 2 of 2

The scans revealed that a tubelike part of the dinos' inner ears called the cochlea was sensitive enough to detect low-frequency sounds produced by the crests.

The team also scanned the skulls of individuals of various ages within each species and found that as the dinosaurs matured, their crests grew and their nasal passages changed shape.



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"The youngsters have just the beginnings of a crest and slightly expanded airway," said study team member Lawrence Witmer, a paleontologist at Ohio University.

"As they get older, they start to develop a much more convoluted airway and a taller crest."

The changes varied between individuals, so the nasal cavities may have been as unique as human fingerprints.

As a result, the duck-bills may have had voices unique enough to tell one another's calls apart, the team speculates.

The images also show that brain regions associated with higher cognitive functions were larger than previously thought, possibly giving the animals the brainpower needed to ID and decipher calls.

The brain scans add to recent finds that weaken the theory that the crests were used to boost sense of smell.

Previous research by a team at the University of Texas had found that the nasal cavities inside the crests couldn't detect odors because they didn't contain nerve tissues.

Likewise, the new study revealed that the region of the brain that controls smell was too small for the dinos to have processed so much extra information.

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