

Dino crests may have had communication role

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Courtesy NSF and [World Science](#) staff

The strange, bony crests on the heads of the duck-billed dinosaurs known as lambeosaurs may have served for communication—both vocal and visual, according to a new study.

The structures contain extremely long, convoluted nasal passages that loop up over the tops of their skulls. In the study, scientists used CT-scanning to look inside these crests and reconstruct the brains and nasal cavities of four different lambeosaur species.



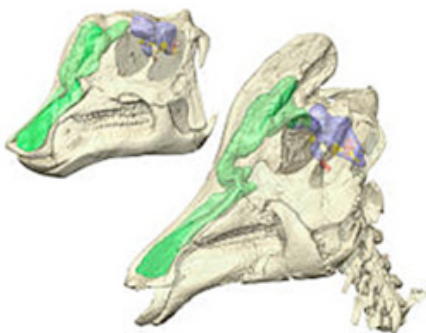
They announced the findings Oct. 16 at the annual meeting of the Society for Vertebrate Paleontology in Cleveland, Ohio.

“These scientists have used cutting-edge visualization and reconstruction techniques to show that duck-billed dinosaurs likely communicated via sound and signal,” said Adam Summers, program director in Division of Integrative and Organismal Systems at the U.S. National Science Foundation, which helped fund the research.

Some paleontologists have suggested that the crests heightened the sense of smell by increasing the surface area of the sensory tissue. Others have argued that they regulated temperature, and still others have speculated that the crests acted as sound resonators for communication.

“The shape of the brain can tell us a lot about what senses were important in a dinosaur’s everyday life, and give insight into the function of the crests,” said David Evans, a paleontologist at the Royal Ontario Museum and the University of Toronto.

“It’s difficult to infer the function of structures in an extinct dinosaur when there is so little resemblance to any living animal,” said Jack Horner, a member of the team and paleontologist at Montana State University.



By using and analyzing the scans, the scientists said they were able to circumvent the problems. “Even though the soft tissues are not preserved in the fossils, the shape of the bones that encase the brain and nasal passages are,” said Evans. “From there, the anatomy of these missing soft parts is easily interpreted.”

The scan results revealed a mismatch between the external shape of the crest and the internal shape of the nasal passages in closely related species, suggesting a special function for the nasal cavity, the investigators said.

The part of the brain responsible for smell was relatively small and primitive, indicating the crest didn't serve to improve that sense.

Computer models done by other researchers suggest that the crests could have been used to make low, eerie bellowing calls that could have been used in communication, perhaps to call for mates or warn others of predators.

The CT scans documented a delicate inner ear that confirms that the dinosaurs could hear the low calls produced by the crest, said Witmer. "We were surprised to see just how large the centers of the brain associated with higher cognitive functions were," said Witmer. "We suspected that the crested duck-billed dinosaurs used both vocal and visual displays, but now we see that they had the brain power and hearing to pull off these behaviors."

Image 1; Reconstruction of the helmet-crested lambeosaur Corythosaurus. (Credit: Michael Skrepnick)

Image 2; CT scan reconstructions of Corythosaurus; the nasal cavity is green, and the brain purple. (Courtesy Witmer & Ridgely, Ohio U.)