

## **Bird-like Dinosaurs with Teeth Died Off Abruptly, Beaked Birds Survived**

Wembley, AB (21 April 2016) – Living birds may have their ancestors' beaks to thank for surviving the mass extinction that wiped out the dinosaurs. New research indicates that beaked birds may have survived because of their ability to eat seeds while their closest toothed relatives went extinct abruptly at the end of the Cretaceous Period. This study is the newest to shed light on how some animals may have survived the massive meteor impact and subsequent climatic turmoil that ended the reign of the dinosaurs. The study was recently published in the journal *Current Biology*.

"We've used the teeth of these bird-like dinosaurs, similar to *Velociraptor*, to show that these dinosaurs were a consistent and stable part of the ecosystem leading up to the end of the Cretaceous," explained lead author of the study Derek Larson, assistant curator at the Philip J. Currie Dinosaur Museum and PhD candidate at the University of Toronto. But that consistency ended at the end of the Cretaceous, when 75% of life on the planet went extinct, including most bird-like dinosaurs.

The bird fossil record at the end of the Cretaceous is very incomplete, so the species that survived the mass extinction are still unknown. With little direct evidence of fossil species surviving the extinction, the reasons as to why some species were able to survive the extinction while their closest relatives went extinct have been unclear. For indirect evidence, the researchers relied on the rich fossil record of isolated small teeth in western North America.

"Skeletons of these small dinosaurs are rare, so isolated teeth represent one of the few consistent sources of data. Here we analyse more than 3,000 of these teeth to give the highest resolution picture of their changing shape," explained the Royal Tyrrell Museum of Palaeontology's Caleb Brown, co-author of the study. Preserved bird and bird-like dinosaur teeth examined in this study were likely suited to eat a variety of animal remains, but not seeds.

"Small teeth have given us big insights into the extinction patterns of bird-like dinosaurs and primitive birds, and a better understanding of how diet might have played a role in the survival of crown-group bird lineages in the wake of the asteroid impact," said principal investigator of the study David Evans of the Royal Ontario Museum and the University of Toronto.

Larson explained, "By analyzing the known diets of modern birds, we can see many groups that probably survived the extinction could have survived by eating seeds, probably one of the few plentiful resources that were available in the climatic upheaval in the aftermath of the asteroid impact. Those dinosaurs without a beak and without the right teeth to access those resources, would have been relegated to extinction."



## **ABOUT THE PHILIP J. CURRIE DINOSAUR MUSEUM**

The Philip J. Currie Dinosaur Museum is an award winning institution for experiential learning dedicated to Alberta's palaeontological heritage through research, collection, preservation, exhibition, public programming, publications, and innovative outreach. Visit/Donate/Support the museum and shop for unique merchandise at [www.dinomuseum.ca](http://www.dinomuseum.ca).

## **CITATION**

Larson, D.W., Brown, C.M., and Evans, D.C. 2016. Dental disparity and ecological stability in bird-like dinosaurs prior to the end-Cretaceous mass extinction. *Current Biology* 26, 1–9.  
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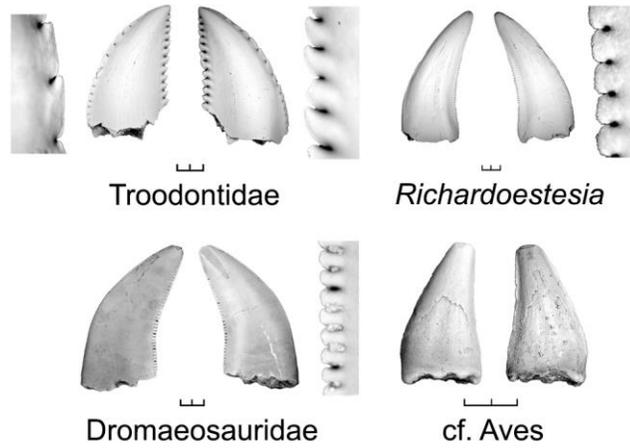
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### **Cretaceous Bird-Like Dinosaurs**

A number of bird-like dinosaurs reconstructed in their environment in the Hell Creek Formation at the end of the Cretaceous. Middle ground and background: two different dromaeosaurid species hunting vertebrate prey (a lizard and a toothed bird). Foreground: hypothetical toothless bird closely related to the earliest modern birds. Image credit: Danielle Dufault.



### **Maniraptoran Dinosaur Teeth**

This image depicts representative teeth from the four groups of bird-like dinosaurs (including toothed birds) analyzed in this study, with enlarged images of tooth serrations. Scale = 1 mm. Photo credit: Don Brinkman. Modified from Larson et al. 2010. *Can. J. Earth Sci.* 47: 1159-1181.