

## Test shows dinosaurs survived mass extinction by 700,000 years

By Brian Murphy January 28, 2011



(Edmonton) University of Alberta researchers have determined that a fossilized dinosaur bone found in New Mexico confounds the long-established paradigm that the age of dinosaurs ended between 65.5 and 66 million years ago.

The U of A team, led by Larry Heaman from the [Department of Earth and Atmospheric Sciences](#), put the femur bone of a sauropod through an elaborate testing procedure and found it's only 64.8 million years old.

Heaman says that means this particular sauropod was alive about 700,000 years after the mass extinction event, which many paleontologists believe wiped all non-avian dinosaurs off the face of Earth forever. It's commonly believed debris from a giant meteorite impact blocked out the sun, causing extreme climate conditions and killing vegetation worldwide.

"If our uranium-lead dating technique bears out on more fossils, than the whole end of the age of dinosaurs paradigm will have to be revised," said Heaman.

Heaman and colleagues used a method called uranium-lead dating to target the age of the fossilized femur of the sauropod. A laser beam unseated minute particles of the bone, which then underwent isotopic analysis.

"This new technique not only allows the age of fossil bone to be determined," said Heaman, "but also potentially distinguishes the type of food a dinosaur ate."

Heaman explains that living bone contains very low levels of uranium, but during fossilization (typically less than 1,000 years after death) bone is enriched in elements like uranium. The uranium atoms in the bone then decay to lead and, once fossilization is complete, the uranium-lead clock starts ticking. Heaman says the isotopic composition of lead determined in the sauropod's femur bone is, therefore, a measure of its absolute age.

Currently, paleontologists date dinosaur fossils using a technique called relative chronology. Where possible, a fossil's age is estimated relative to the known depositional age of a layer of sediment in which it was found. Heaman says this method is limited because researchers have to be certain of the age of the rock layers surrounding the fossil.

Another potential weakness in the relative chronology approach cited by Heaman is that, over millions of years, geologic and environmental forces may cause erosion of a fossil-bearing layer of rock, and cause the fossil to drift or migrate from its original layer in the strata. Heaman says his direct-dating technique eliminates that kind of false age reading.

Heaman and his research colleagues say there could be several reasons why the New Mexico sauropod came from a line of dinosaurs that survived the great mass extinction events of the late Cretaceous period or, as it's also known, the KT extinction event. Heaman says it's possible that in some areas the vegetation wasn't wiped out and a number of the sauropod species survived. The researchers also say the potential survival of dinosaur eggs during extreme climatic conditions needs to be explored.

Heaman says uranium lead testing could open new doors in dinosaur research.

"Our technique could eliminate old dating errors," said Heaman. "Current theories, that dinosaurs on opposite sides of the world lived at the same time because their bones are similar, can now be proven or disproven by direct aging of the fossils"

The research was published online Jan. 26 in the journal *Geology*.