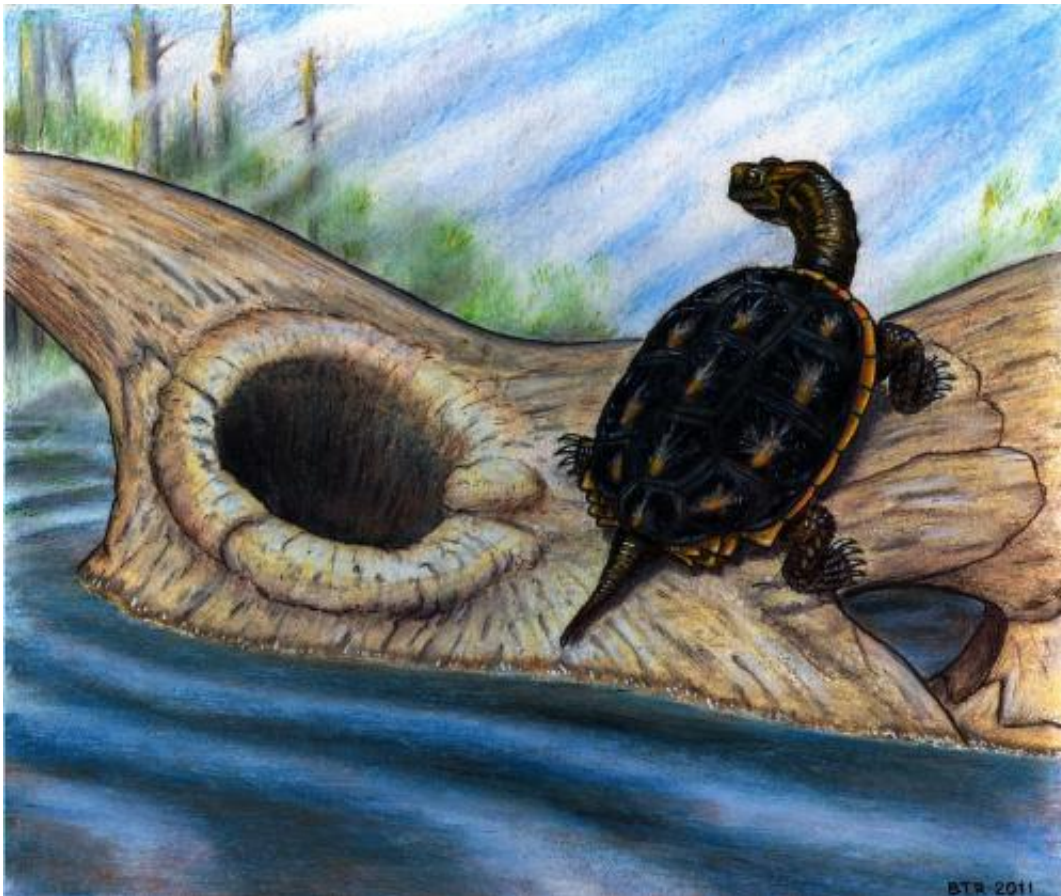


# Tough turtles survive cretaceous meteorite impact

July 12 2011

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Reconstruction of the baenid turtle *Boremys* basking on a *Triceratops* dinosaur skull. *Boremys* was one of several turtles that survived the asteroid impact that killed the dinosaurs (other than birds) at the end of the Cretaceous Period. Illustration by Brian T. Roach, Yale Peabody Museum.

(PhysOrg.com) -- New fossil localities from North Dakota and Montana have produced the remains of a turtle that survived the 65 million-year-old meteorite impact that wiped out the dinosaurs. The resulting study, published in the latest issue of the Journal of Vertebrate Paleontology, suggests that Boremys, a turtle that belongs to a group known as the baenids (bay-ee-nids) survived the extinction event unharmed. Baenids are a group of extinct river turtles native to North America that flourished from approximately 80 million to 42 million years ago.

The lead author, Tyler Lyson from Yale University, has been collecting turtles from the western United States for years, and immediately realized the importance of these new [specimens](#), "This find further confirms that turtles were not fazed by the meteorite that killed the [dinosaurs](#) 65 million years-ago."

The survival of turtles during this massive [extinction event](#) appears counterintuitive with what we know about other organisms. While other groups of animals show high rates of extinction at the [Cretaceous](#) /Paleocene (K/T) boundary 65-million-years ago, this new discovery provides more data indicating that turtles were largely unaffected by the meteorite impact. Lyson and colleagues found that if you just looked at turtles during this time, you would not even notice that one of the largest extinction events in Earth's history had occurred.

The researchers recovered the new Boremys turtle remains from rocks in southwestern North Dakota and eastern Montana. These rock formations, known as the Hell Creek and Fort Union, respectively, have been actively collected for fossils by paleontologists for more than 100 years. This new study proves that even in well-searched localities, new fossil discoveries can still be uncovered. Co-author Dr. Walter Joyce acknowledged his surprise with the [new discovery](#), "At first I did not believe Tyler when he told me that he had found Boremys in Paleocene deposits."

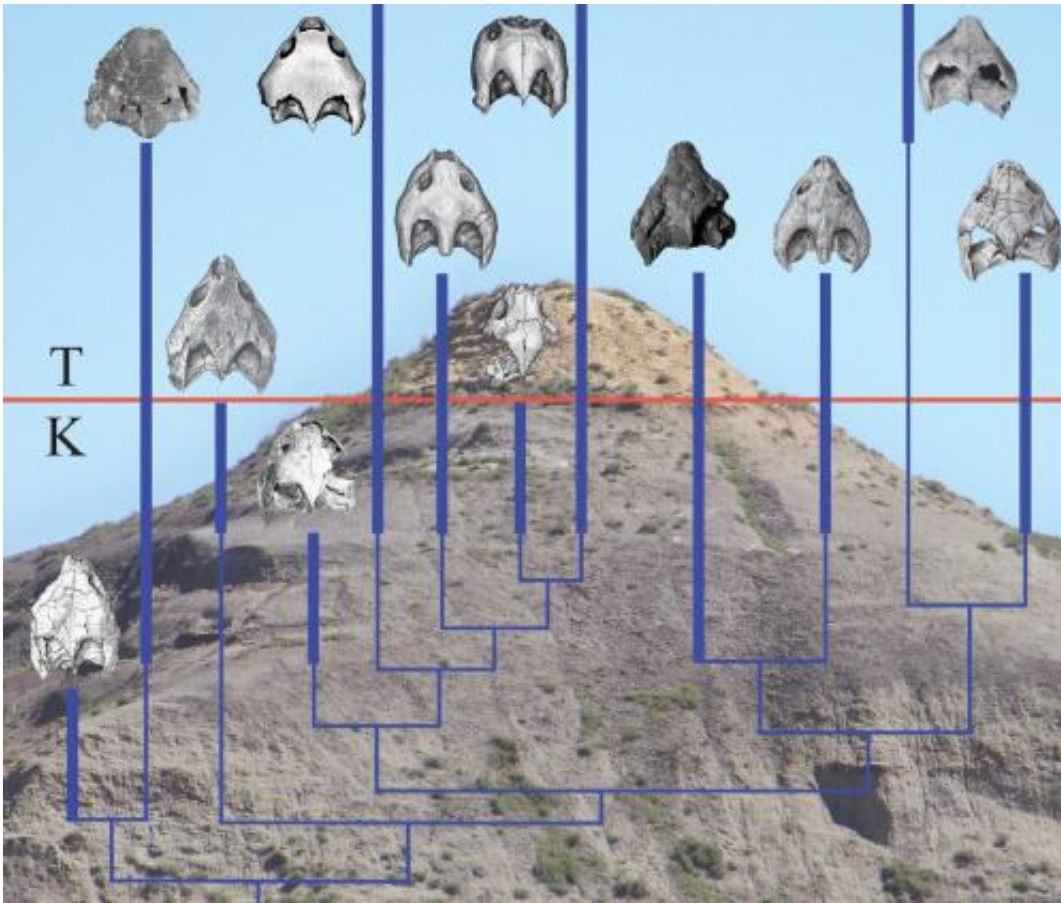


Diagram of the many types of turtles that survived the K/T extinction event. The skulls of these turtles are illustrated (as viewed from above) as are their fossil record (thick blue bars) and evolutionary relationships (thin lines connecting bars). The red line marks the extinction event, and is matched with the photographic of the geologic section in the background. The rocks below the red line were deposited during the Age of Dinosaurs (Mesozoic Era), whereas those above the line were deposited at the beginning of the Age of Mammals (Cenozoic Era). Note that eight different lineages of turtles survived the event, while only two went extinct at the event. Image courtesy of Erik Freeman.

Lyson and his co-authors believe that features of the shell of *Boremys* did not help its chances of preservation in the fossil record. The turtle had very thin shell bones relative to other baenids, and they remained

unfused throughout the turtle's life. These features likely led to its skeleton being scattered after death, making the chances of a whole shell being preserved very low. The authors also noted that the features of the shell were very similar to another turtle species living at the same time, which lead to initial misidentification.

With the discovery of this turtle, Lyson and his colleagues can now say that at least eight types of baenid turtles survived the [meteorite impact](#) that killed so many other animals.

**More information:** LYSON, T. R., W. G. JOYCE, G. E. KNAUSS, AND D. A. PEARSON. 2011. BOREMYS (TESTUDINES, BAENIDAE) FROM THE LATEST CRETACEOUS AND EARLY PALEOCENE OF NORTH DAKOTA: AN 11-MILLION-YEAR RANGE EXTENSION AND AN ADDITIONAL K/T SURVIVOR. JOURNAL OF VERTEBRATE PALEONTOLOGY 31(4):1-9.  
[www.tandfonline.com/toc/ujvp20/current](http://www.tandfonline.com/toc/ujvp20/current)

Provided by Society of Vertebrate Paleontology

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