Scientists find first ever southern tyrannosaur dinosaur

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A 66-million-year-old Tyrannosaurus rex skeleton dubbed "Samson" is displayed at the Venetian Resort Hotel Casino in Las Vegas, Nevada in 2009. Tyrannosaurus rex, once believed to have only roamed the Earth north of the Equator, may also have lived in the southern hemisphere, paleontologists said Thursday.

(PhysOrg.com) -- Scientists from Cambridge, London and Melbourne have found the first ever evidence that tyrannosaur dinosaurs existed in the southern continents. They identified a hip bone found at Dinosaur Cove in Victoria, Australia as belonging to an ancestor of *Tyrannosaurus rex*.

The find sheds new light on the evolutionary history of this group of dinosaurs. It also raises the crucial question of why it was only in the north that tyrannosaurs evolved into the giant predators like *T. rex*.

The 30cm-long pubis bone from Dinosaur Cove looks like a rod with two expanded ends, one of which is flattened and connects to the hip and the other looks like a 'boot'.

According to Dr Roger Benson of the Department of Earth Sciences at the University of Cambridge, who identified the find: "The bone is unambiguously identifiable as a tyrannosaur because these dinosaurs have very distinctive hip bones."

The discovery lays to rest the belief held by some scientists that tyrannosaurs never made it to the southern continents.

"This is an exciting discovery because tyrannosaur fossils had only ever been found in the northern hemisphere before and some scientists thought tyrannosaurs never made it down south.

"Although we only have one bone, it shows that 110 million years ago small tyrannosaurs like ours might have been found worldwide. This find has major significance for our knowledge of how this group of dinosaurs evolved." says Dr Benson.

Dr Paul Barrett, Palaeontologist at the Natural History Museum, London and member of the research team commented: "The absence of tyrannosauroids from the southern continents was becoming more and more anomalous as representatives of other 'northern' dinosaur groups started to show up in the south. This find shows that tyrannosauroids were able to reach these areas early in their evolutionary history and also hints at the possibility that others remain to be discovered in Africa, South America and India."

The first relative of Tyrannosaurus rex from the southern continents has been discovered in Dinosaur Cove, Australia, shown on this map of the Earth 110 million years ago. © Dr Roger Benson, University of Cambridge

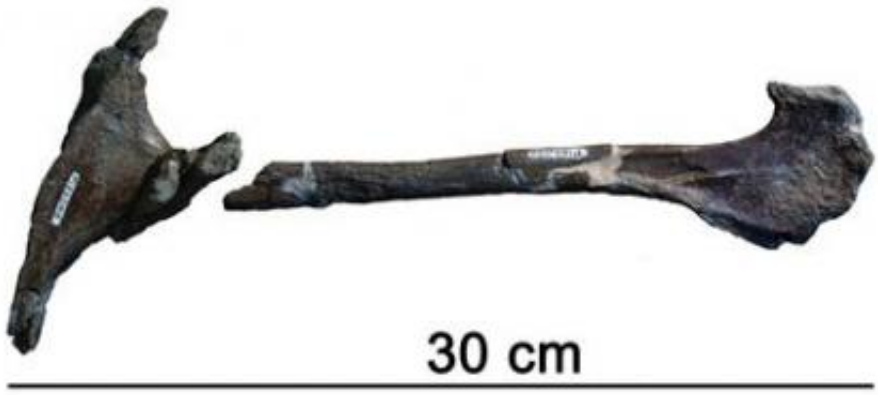
The bone would have come from an animal about three metres long and weighing around 80 kg, similar to a human, and would have had the large head and small arms that make tyrannosaurs so distinctive.

The newly identified dinosaur, known as NMV P186069, was much smaller than *T. rex*, which was 12 metres long and weighed around four tonnes. Giant size like this only evolved late in the tyrannosaur lineage.

Compared with *T. rex*, which lived about 70 million years ago at the end of Cretaceous period, NMV P186069 lived earlier during the Cretaceous, around 110 million years ago.

During the time of the dinosaurs the continents gradually went from a single supercontinent towards something like their present-day

arrangement. This tyrannosaur is from the mid-stages of this continental break-up, when the southern continents of South America, Antarctica, Africa and Australia had separated from the northern continents, but had not separated from each other.



Part of the 110-million-year-old hip bone of an ancestor of T.rex uncovered in Australia © Dr Roger Benson, University of Cambridge

While answering the question of whether or not tyrannosaurs lived in both the southern and northern hemispheres, the new find leaves another, deeper mystery: why did tyrannosaurs evolve into giant predators such as *T. rex* only in the northern hemisphere?

According to Dr Benson: "It is difficult to explain why different groups succeeded in the north and the south if they originally existed in both places. What we need to know now is just how diverse the early radiation of tyrannosaurs was, why they went extinct, leaving only giant-sized, short-armed species like *T. rex*, and how successful they might have been in the southern hemisphere. We can only answer these questions with new discoveries."

The paper is published today in *Science*.

More information: Roger B. J. Benson et al, 'A Southern Tyrant Reptile' is published in *Science* on 25 March 2010.

Provided by University of Cambridge