Facts, images, & animations for the juvenile tyrannosaur story

Dinosaur species: *Tarbosaurus bataar* ("the Asian *Tyrannosaurus rex*")
Family: Tyrannosauridae
Time period: Late Cretaceous, 70 million years ago
Discovery: found in 2006 in the Gobi Desert of Mongolia by a joint expedition of the Hayashibara Museum of Natural Sciences and the Mongolian Paleontological Center
The fossil: the youngest and most complete skull of a tyrannosaur. Only the neck and two-thirds of the tail are missing.

Major points:

a. This is the youngest, most complete skull of a tyrannosaur found anywhere in the world
b. *Tarbosaurus bataar* is very closely related to *T. rex* and was generally extremely similar
c. The juvenile skull is much more delicate and lacks almost all of the structural specialization seen in the skull of adult *Tarbosaurus* for powerful biting and twisting.
d. Juveniles must have fed on different prey types than adults, relying more on speed and agility than power. They would have had to have taken smaller prey that would not have struggled as much, because their skulls couldn't handle the stress.
e. The juvenile skull is important because it's among the very few young tyrannosaur skulls that can unequivocally be identified to species, and so sheds important light on more controversial isolated finds.

Comparison of juvenile and adult *Tarbosaurus*

	new juvenile *Tarbosaurus* specimen	Adult *Tarbosaurus*
Age	2–3 years old	25 years old
Weight	70 pounds	6 tons (12,000 pounds)
Length	9 feet	35–40 feet
Height at the hip	3 feet	15 feet
Skull length	11.4 inches	4 feet

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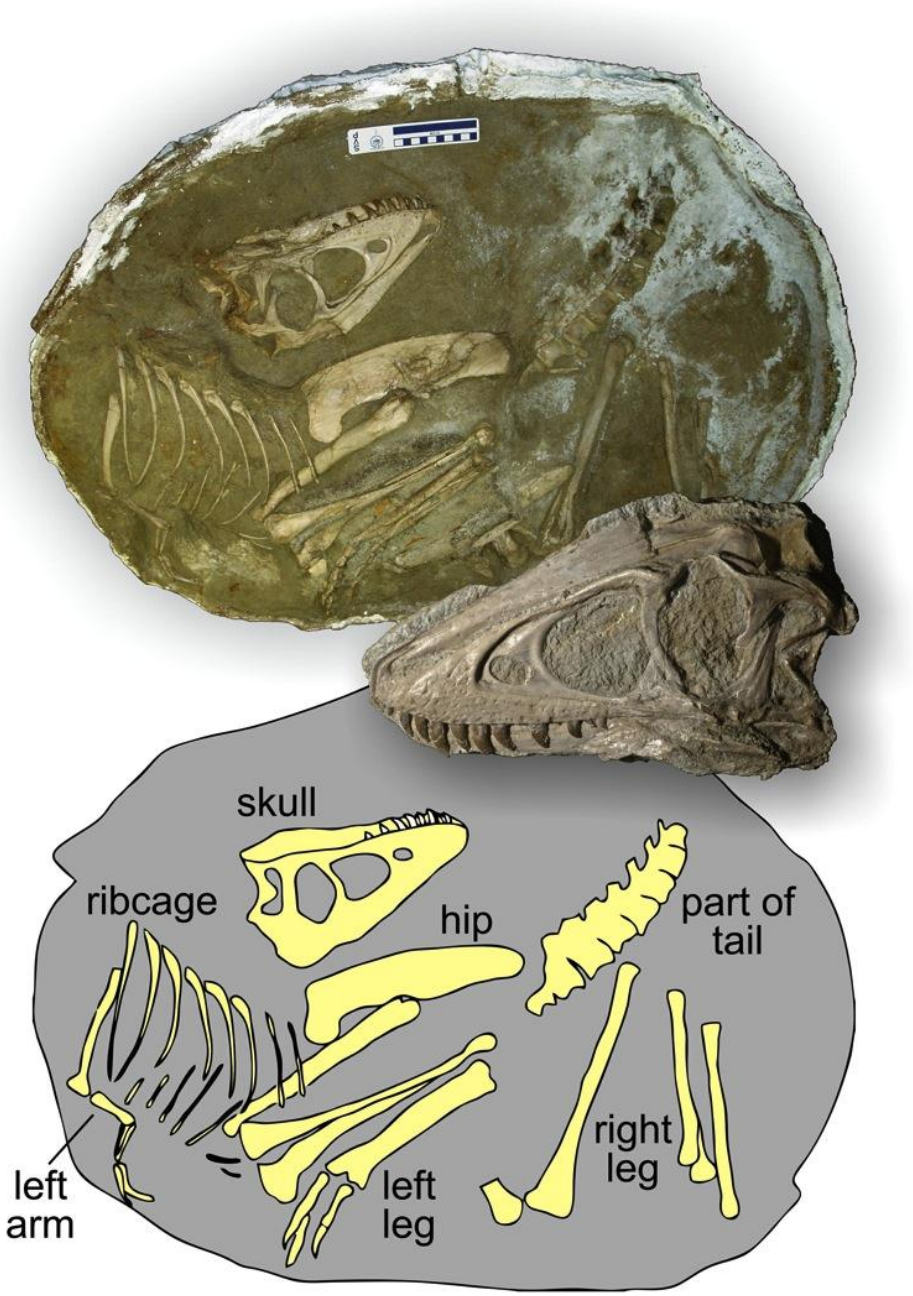
For downloadable graphics and animation, visit: http://www.oucom.ohiou.edu/dbms-witmer/tarbosaurus_skull.htm

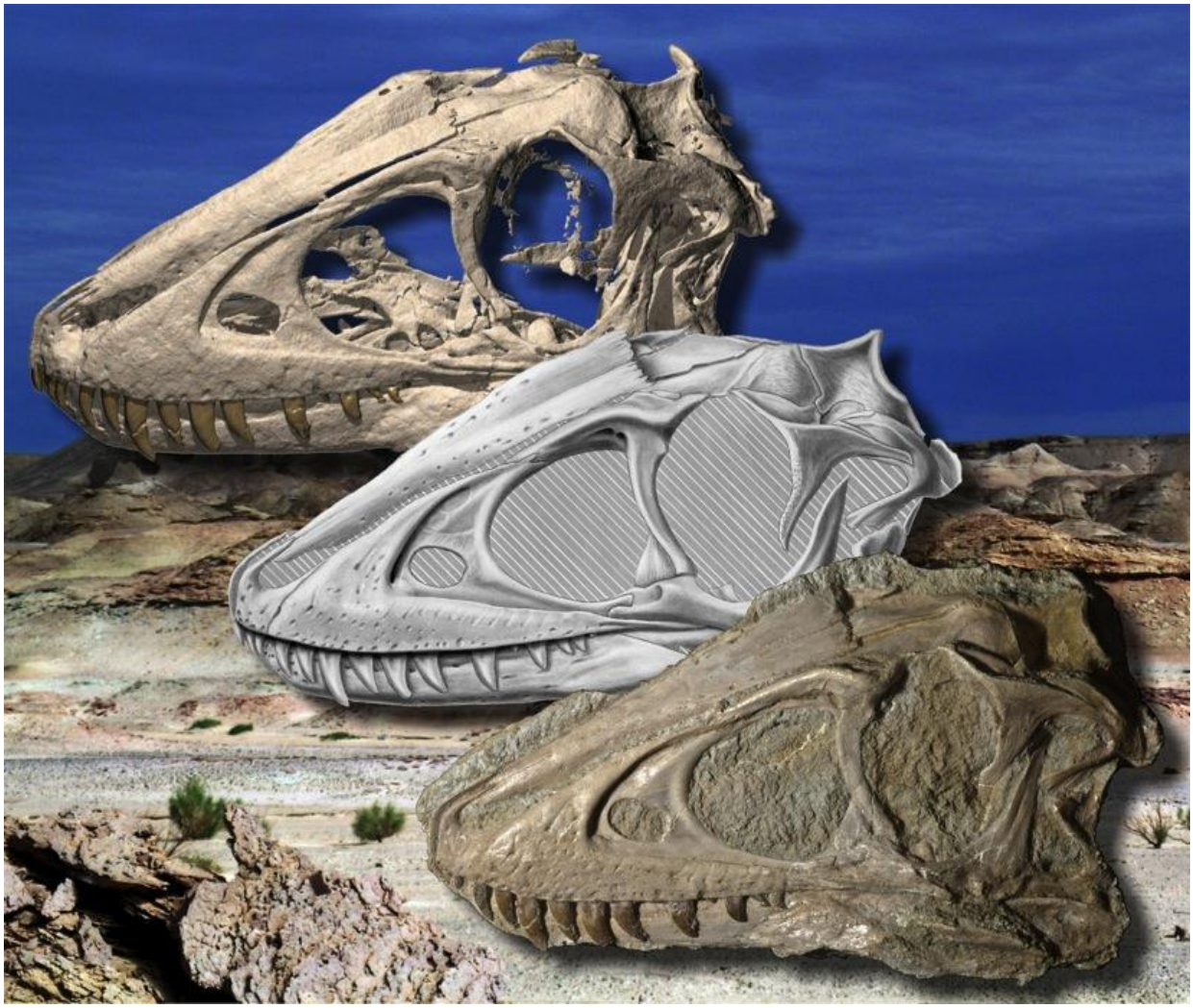
Images and animations

(Note: Images are compressed for this document. Click the links to download larger files)



The youngest and most complete skeleton including a skull of a tyrannosaur ever found. This 2-year-old individual of *Tarbosaurus* discovered in Cretaceous rocks in Mongolia weighed only 70 pounds but would have grown up to be a 6-ton mega-predator. Courtesy of the Hayashibara Museum of Natural Sciences and WitmerLab at Ohio University.

Download 300-dpi JPG: http://www.oucom.ohiou.edu/dbms-witmer/juvenile_tyrannosaur/Tarbosaurus_block_with_outline.jpg



Skull of a 2-year-old juvenile *Tarbosaurus*, a Cretaceous tyrannosaur from Mongolia. The skull is represented by a photograph (lower right), a drawing (center), and a computer rendering with rock removed based on CT scanning (top left). Courtesy of the Hayashibara Museum of Natural Sciences and WitmerLab at Ohio University.

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A newly discovered specimen of the Mongolian tyrannosaur *Tarbosaurus* comes from a juvenile only 2-3 years old when it died, providing insight into the growth and changing lifestyles of tyrannosaurs. Animation by Ridgely and Witmer, Courtesy of WitmerLab at Ohio University. The animation accompanies an article published in May 2011 in the journal of Vertebrate Paleontology by Tsuihiji and others: http://bit.ly/jV7FN4

• YouTube version: http://www.youtube.com/watch?v=ucE-6mEgy1E
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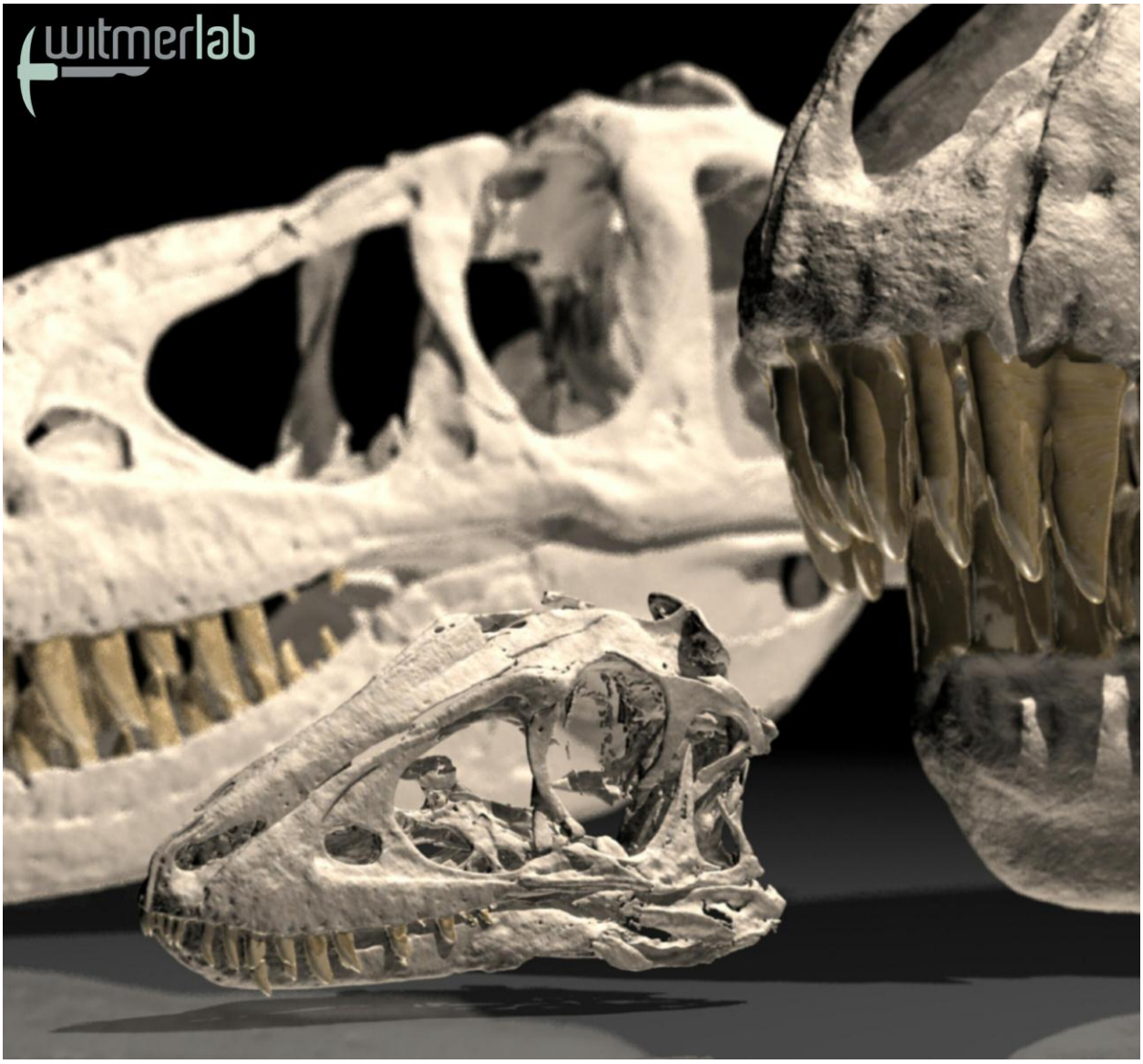

Skull of a 2-year-old juvenile *Tarbosaurus*, a Cretaceous tyrannosaur from Mongolia, with an adult skull at right and a teenage skull behind for comparison. Courtesy of WitmerLab at Ohio University.

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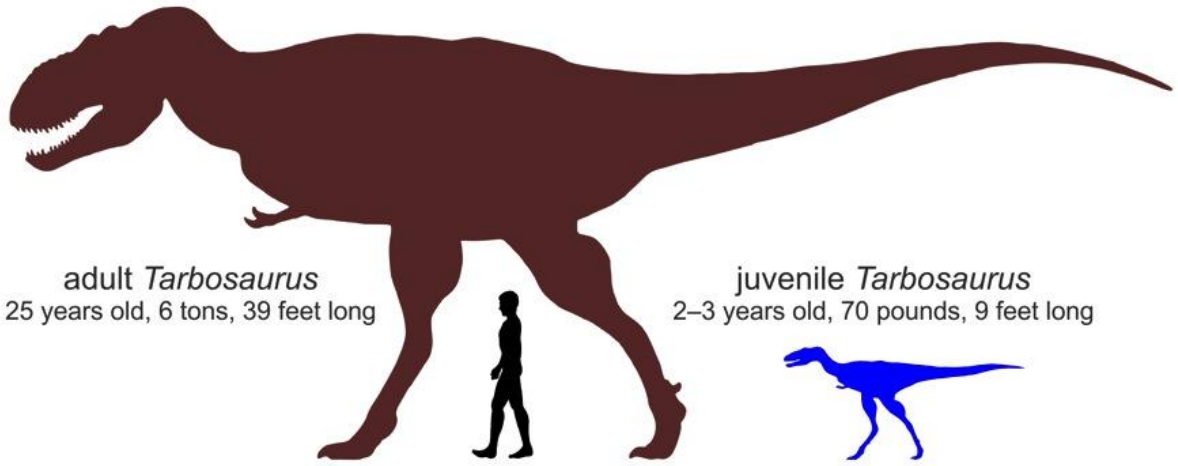

Silhouettes of an adult *Tarbosaurus* and the newly discovered juvenile, along with a human for scale. Courtesy of the Hayashibara Museum of Natural Sciences.

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In 2006, workers from the Hayashibara Museum of Science and Mongolian Paleontological Center (including study coauthors, Yasuhiro Kawahara, left, and Takehisa Tsubamoto, right) excavated the skeleton of the juvenile *Tarbosaurus* from 70-million-year-old rocks in Mongolia. Courtesy of the Hayashibara Museum of Natural Sciences.

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The youngest and most complete skeleton including a skull of a tyrannosaur ever found. This 2-year-old individual of *Tarbosaurus* discovered in Cretaceous rocks in Mongolia weighed only 70 pounds but would have grown up to be a 6-ton mega-predator. Courtesy of the Hayashibara Museum of Natural Sciences.

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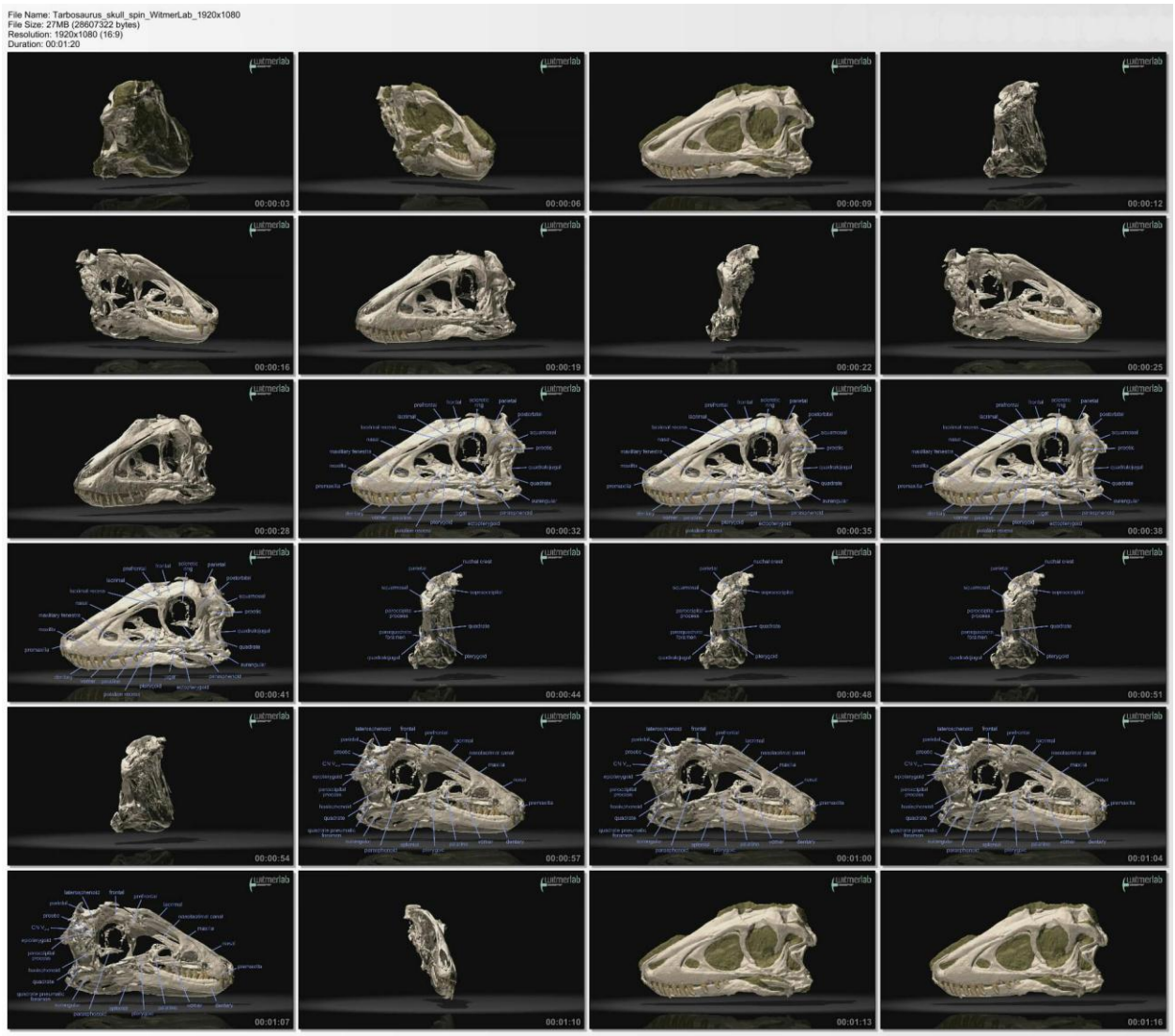

Animation of the skull of a newly discovered juvenile specimen of the Mongolian tyrannosaur Tarbosaurus with the bones and some other anatomical structures labeled. The juvenile was only 2-3 years old when it died, providing insight into the growth and changing lifestyles of tyrannosaurs. The animation accompanies an article published in May 2011 in the journal of Vertebrate Paleontology by Tsuihiji and others: http://bit.ly/jV7FN4 Movie by Ridgely & Witmer, Courtesy of WitmerLab at Ohio University.

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