

Fossil dig leads to unexpected discovery of 91-million-year-old shark new to science

November 18 2019



Credit: Taylor & Francis

A 91-million-year-old fossil shark newly named *Cretodus houghtonorum* discovered in Kansas joins a list of large dinosaur-era animals. Preserved in sediments deposited in an ancient ocean called the Western Interior Seaway that covered the middle of North America during the Late

Cretaceous period (144 million to 66 million years ago), *Cretodus houghtonorum* was an impressive shark estimated to be nearly 17 feet or slightly more than 5 meters long based on a new study appearing in the *Journal of Vertebrate Paleontology*.

The fossil shark was discovered and excavated in 2010 at a ranch near Tipton, Kansas, in Mitchell County by researchers Kenshu Shimada and Michael Everhart and two central Kansas residents, Fred Smith and Gail Pearson. Shimada is a professor of paleobiology at DePaul University in Chicago. He and Everhart are both adjunct research associates at the Sternberg Museum of Natural History, Fort Hays State University in Hays, Kansas. The species name *houghtonorum* is in honor of Keith and Deborah Houghton, the landowners who donated the specimen to the museum for science.

Although a largely disarticulated and incomplete skeleton, it represents the best *Cretodus* specimen discovered in North America, according to Shimada. The discovery consists of 134 teeth, 61 vertebrae, 23 placoid scales and fragments of calcified cartilage, which when analyzed by scientists provided a vast amount of biological information about the extinct shark. Besides its estimated large body size, anatomical data suggested that it was a rather sluggish shark, belonged to a shark group called Lamniformes that includes modern-day great white and [sand tiger sharks](#) as distant cousins, and had a rather distinct tooth pattern for a lamniform shark.

"Much of what we know about extinct sharks is based on isolated teeth, but an associated specimen representing a single shark individual like the one we describe provides a wealth of anatomical information that in turn offers better insights into its ecology," said Shimada, the lead author on the study.

"As important ecological components in [marine ecosystems](#),

understanding about sharks in the past and present is critical to evaluate the roles they have played in their environments and biodiversity through time, and more importantly how they may affect the future marine ecosystem if they become extinct," he said.

During the excavation, Shimada and Everhart believed they had a specimen of *Cretodus crassidens*, a species originally described from England and subsequently reported commonly from North America. However, not even a single tooth matched the tooth shape of the original *Cretodus crassidens* specimen or any other known species of *Cretodus*, Shimada said.

"That's when we realized that almost all the teeth from North America previously reported as *Cretodus crassidens* belong to a different species new to science," he noted.

The growth model of the shark calibrated from observed vertebral growth rings indicates that the shark could have theoretically reached up to about 22 feet (about 6.8 meters).

"What is more exciting is its inferred large size at birth, almost 4 feet or 1.2 meters in length, suggesting that the cannibalistic behavior for nurturing embryos commonly observed within the uteri of modern female lamniforms must have already evolved by the late Cretaceous period," Shimada added.

Furthermore, the *Cretodus houghtonorum* fossil intriguingly co-occurred with isolated teeth of another shark, *Squalicorax*, as well as with fragments of two fin spines of a yet another shark, a hybodont shark.

"Circumstantially, we think the shark possibly fed on the much smaller hybodont and was in turn scavenged by *Squalicorax* after its death," said Everhart.

Discoveries like this would not be possible without the cooperation and generosity of local landowners, and the local knowledge and enthusiasm of amateur fossil collectors, according to the authors.

"We believe that continued cooperation between paleontologists and those who are most familiar with the land is essential to improving our understanding of the geologic history of Kansas and Earth as a whole," said Everhart.

The new study, "A new large Late Cretaceous lamniform shark from North America with comments on the taxonomy, paleoecology, and evolution of the genus *Cretodus*," will appear in the forthcoming issue of the *Journal of Vertebrate Paleontology*.

More information: Kenshu Shimada et al. A New Large Late Cretaceous Lamniform Shark from North America, with Comments on the Taxonomy, Paleoecology, and Evolution of the Genus *Cretodus*, *Journal of Vertebrate Paleontology* (2019). [DOI: 10.1080/02724634.2019.1673399](https://doi.org/10.1080/02724634.2019.1673399)

Provided by Taylor & Francis

Citation: Fossil dig leads to unexpected discovery of 91-million-year-old shark new to science (2019, November 18) retrieved 27 April 2024 from <https://phys.org/news/2019-11-fossil-unexpected-discovery-million-year-old-shark.html>

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