

Fossil teeth reveal ancient hyenas in the Arctic

June 18 2019



An artist's rendering of ancient Arctic hyenas belonging to the genus *Chasmaporthetes*. A new study reports that two enigmatic fossil teeth found in Yukon Territory in Canada belonged to *Chasmaporthetes*, making the teeth the first known fossils of hyenas found in the Arctic. Credit: Julius T. Csotonyi

Modern hyenas are known as hunters and scavengers in Asian and African ecosystems such as the savanna.

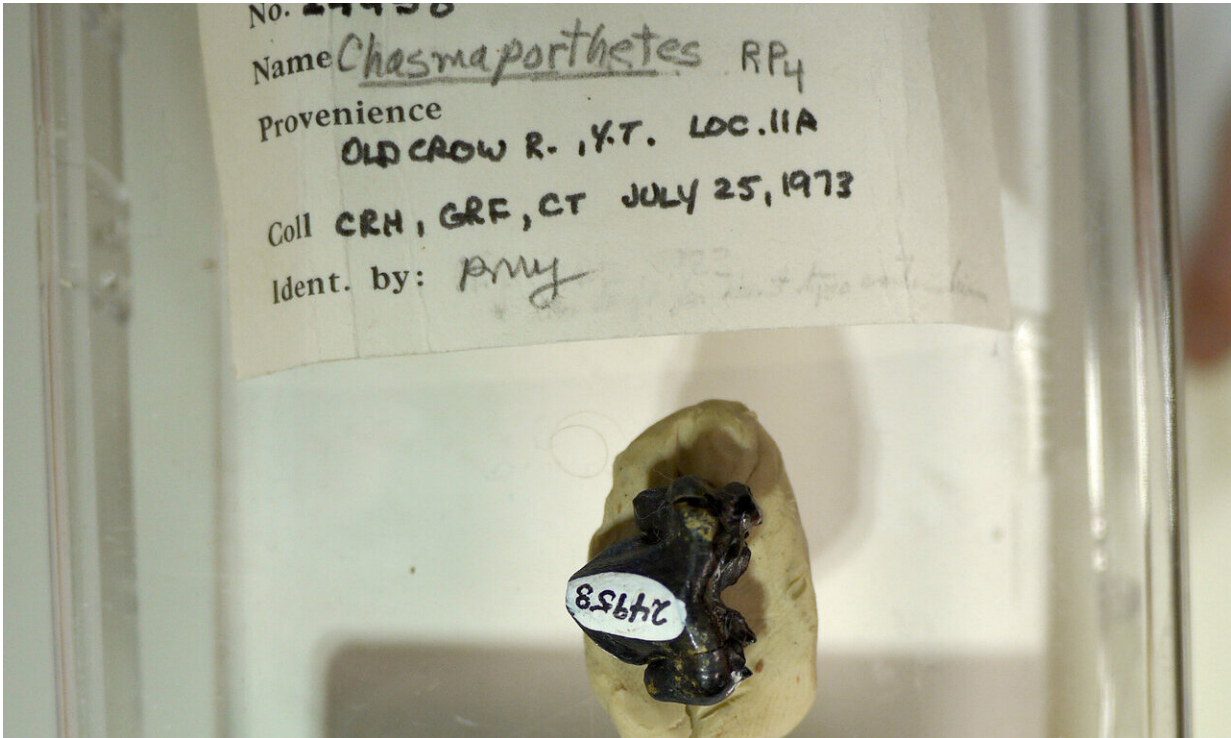
But in [ancient times](#), these powerful carnivores also roamed a very different landscape, inhabiting the frigid Arctic during the last ice age, according to a new study led by the University at Buffalo.

The research, which will be published on June 18 in the journal *Open Quaternary*, reports on the first known fossils of hyenas from the Arctic. The study and all information in this [press release](#) are embargoed until 6 a.m. U.S. Eastern Time on Tuesday, June 18.

The study reveals that two ice age fossil teeth discovered in Yukon Territory in Canada belonged to the so-called "running hyena" *Chasmaporthetes*. The specimens, recovered in the 1970s, were tentatively thought to be from hyenas by previous paleontologists, but the new paper is the first to confirm the fossils' identity and report on them in detail, assigning them a genus based on comparisons to a global sample of hyena fossils.

The findings fill an important gap in scientists' knowledge of how hyenas reached North America. Previously, *Chasmaporthetes* fossils had been found as far north as Mongolia in Asia and the southern United States in North America, with no sites in between.

"Fossils of this genus of hyenas had been found in Africa, Europe and Asia, and also in the southern United States. But where and how did these animals get to North America? The teeth we studied, even though they were just two teeth, start to answer those questions," says paleontologist Jack Tseng, Ph.D., the paper's first author and an assistant professor of pathology and anatomical sciences in the Jacobs School of Medicine and Biomedical Sciences at UB.



This ice age fossil tooth -- tucked away for years in the collections of the Canadian Museum of Nature -- belonged to the 'running hyena' Chasmaporthetes, according to a new University at Buffalo-led study. This tooth, found in 1973, and one other are the first known hyena fossils found in the Arctic. Credit: Jack Tseng

How hyenas got to North America

Ancient hyenas likely entered North America via Beringia, an area, including Alaska and Yukon Territory, that connects Asia with North America during periods of low sea levels. From there, the animals made their way south all the way to Mexico, scientists say.

The newly described fossils are important in part because they provide the first proof of ancient hyenas living in Beringia.

"It is amazing to imagine hyenas thriving in the harsh conditions above the Arctic Circle during the ice age," says study co-author Grant Zazula, Ph.D., Government of Yukon paleontologist. "Chasmaporthetes probably hunted herds of ice age caribou and horses or scavenged carcasses of mammoths on the vast steppe-tundra that stretched from Siberia to Yukon Territory."

"Our previous understanding of where these far-ranging hyenas lived was based on [fossil records](#) in southern North America on one hand, and Asia, Europe and Africa on the other," Tseng says. "These rare records of hyenas in the Arctic fill in a massive gap in a location where we expected evidence of their crossing between continents, but had no proof until now."

The fossil teeth are most likely between about 1.4 million and 850,000 years old, with ages more likely closer to the older figure, according to the researchers' analysis. But the first hyenas crossed into North America long before that, as the earliest known hyena fossils on the continent date back about 5 million years, Tseng says.



This ice age fossil tooth -- tucked away for years in the collections of the Canadian Museum of Nature -- belonged to the 'running hyena' Chasmaporthetes, according to a new University at Buffalo-led study. This tooth, found in 1977, and one other are the first known hyena fossils found in the Arctic. Credit: Grant Zazula / Government of Yukon

Enigmatic fossil teeth identified

The fossil teeth were collected in the 1970s during paleontological expeditions in the remote Old Crow River region in northern Yukon Territory. One tooth was discovered by Richard "Dick" Harington, Gerry Fitzgerald and Charlie Thomas, and the other by Brenda Beebe and William Irving.

The specimens—tucked away in the collections of the Canadian

Museum of Nature in the Ottawa, Ontario area—are among 50,000 other fossils recovered from the area over the last century.

The identity of the fossil teeth remained an enigma until they captured Tseng's attention, sparked by the re-discovery of decades-old notes by study co-author Lars Werdelin, paleontologist in the Swedish Museum of Natural History.

Tseng drove to Ottawa from Buffalo in February 2019 to view the specimens. As an expert on the evolution and fossil record of hyenas, he was able to identify the [teeth](#) as belonging to the genus *Chasmaporthetes*.

Though there are only four living species of hyena today (three bone-crushing species, plus the ant-eating aardwolf), ancient [hyenas](#) had a diverse family history, with many dozens of species found in localities spanning the Northern Hemisphere.

Hyenas disappeared from North America before the first people arrived. Although the reasons for this extinction between 1 and 0.5 million years ago remain unclear, it is possible that the animals' bone-crushing, scavenging niche was replaced by the impressive short-faced bear *Arctodus simus*, which lived across North America until the end of the ice age about 12,000 years ago.

More information: *Open Quaternary*, [DOI: 10.5334/oq.64](https://doi.org/10.5334/oq.64)

Provided by University at Buffalo

Citation: Fossil teeth reveal ancient hyenas in the Arctic (2019, June 18) retrieved 27 April 2024 from <https://phys.org/news/2019-06-fossil-teeth-reveal-ancient-hyenas.html>

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