

Tooth buried in bone shows two prehistoric predators tangled across land, sea boundaries

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Teeth from phytosaurs, a reptile from the Triassic Period about 210 million years ago in what is now the western United States. The blue tooth on the left is a 3-D printed replica of a tooth embedded in the thigh bone of a rousuchid, another Triassic period carnivore. The details of the tooth were digitally extracted using CT scans.

(Phys.org) —About 210 million years ago when the supercontinent of

Pangea was starting to break up and dog-sized dinosaurs were hiding from nearly everything, entirely different kinds of reptiles called phytosaurs and rauisuchids were at the top of the food chain.

It was widely believed the two top predators didn't interact much as the former was king of the water, and the latter ruled the land. But those ideas are changing, thanks largely to the contents of a single bone.

In a paper published online in September in the German journal *Naturwissenschaften*, Stephanie Drumheller of the University of Tennessee and Michelle Stocker and Sterling Nesbitt, vertebrate paleontologists with the Virginia Tech's Department of Geosciences, present evidence the two creatures not only interacted, but did so on purpose.

"Phytosaurs were thought to be dominant aquatic predators because of their large size and similarity to modern crocodylians," said Stocker, "but we were able to provide the first direct evidence they targeted both aquatic and large terrestrial prey."

The evidence? A tooth. Not just any tooth, but the tooth of a phytosaur lodged in the [thigh bone](#) of a rauisuchid, a creature about 25 feet long and 4 feet high at the hip. The tooth lay broken off and buried about two inches deep in bone, and then healed over, indicating the rauisuchid survived the attack.

"Finding teeth embedded directly in [fossil bone](#) is very, very rare," Drumheller said. "This is the first time it's been identified among phytosaurs, and it gives us a smoking gun for interpreting this set of bite marks."

The researchers came across the bone by chance at the University of California Museum of Paleontology in Berkeley.

"It was remarkable we were able to reconstruct a part of an ancient food web from over 210 million years ago from a few shallow marks and a tooth in a bone," said Nesbitt. "It goes to show how careful observation can lead to important discoveries even when you're not seeking those answers.

"We came across this bone and realized pretty quickly we had something special," Nesbitt said. "There are many bones that get dug up, not all are immediately processed, prepared, and studied. No one had recognized the importance of this specimen before but we were able to borrow it and make our study."

The large rauisuchid thigh [bone](#) at the center of the research has the [tooth](#) of the attacker, which the researchers recreated using CT scans and a 3-D printer. Multiple bite marks indicate the creature was preyed upon at least twice over the course of its life, by phytosaurs.

"This research will call for us to go back and look at some of the assumptions we've had in regard to the Late Triassic ecosystems," Stocker said. "The distinctions between aquatic and terrestrial distinctions were over-simplified and I think we've made a case that the two spheres were intimately connected."

More information: "Direct evidence of trophic interactions among apex predators in the Late Triassic of western North America."

Stephanie K. Drumheller, Michelle R. Stocker, Sterling J. Nesbitt, *Naturwissenschaften* September 2014. link.springer.com/article/10.1007/s00114-014-1238-3

Provided by Virginia Tech

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