

# 'Hammerhead' creature was world's first plant-eating marine reptile

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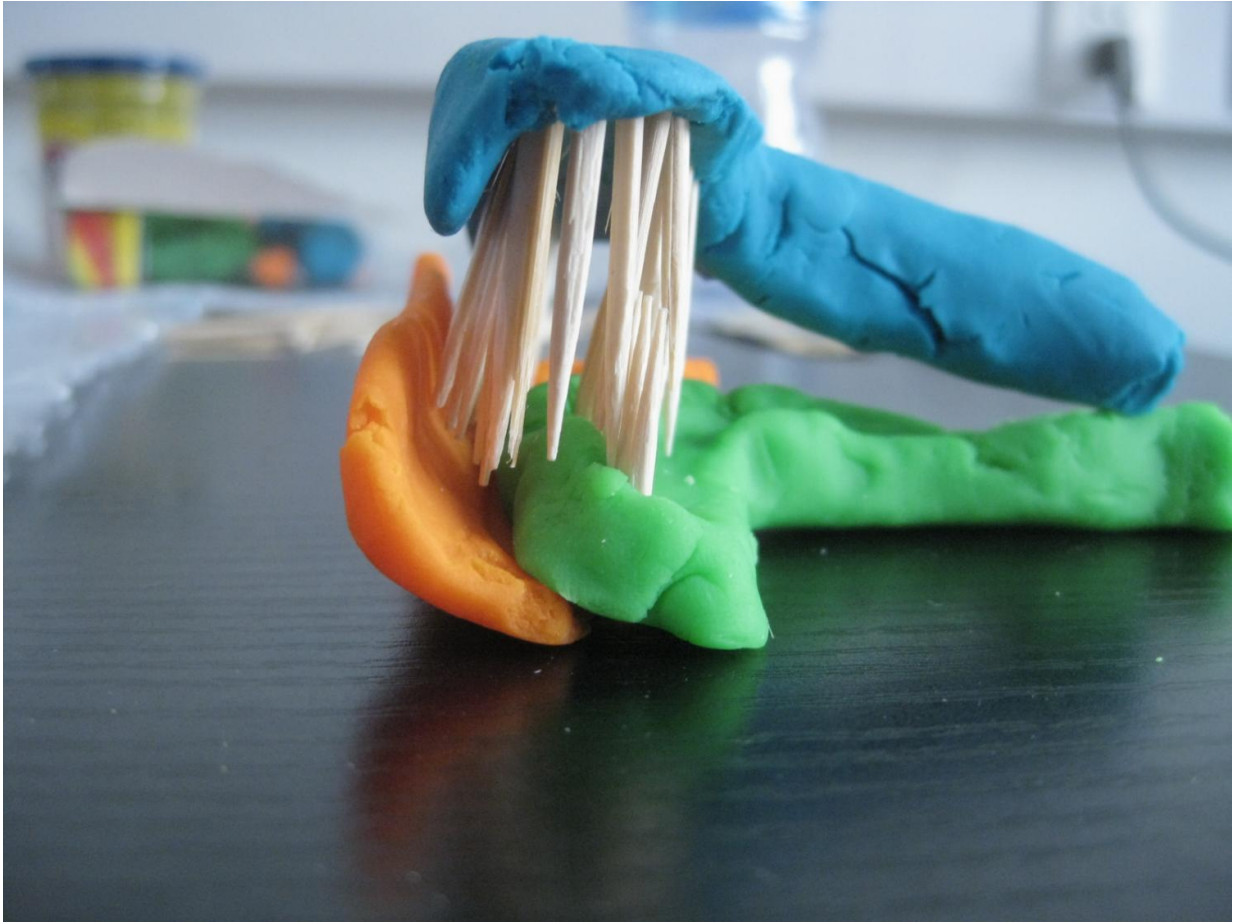
A fossil of *Atopodenatus unicus* is alongside a reconstruction showing what it would have looked like in life. Credit: © Nick Fraser

In 2014, scientists discovered a bizarre fossil—a crocodile-sized sea-dwelling reptile that lived 242 million years ago in what today is southern China. Its head was poorly preserved, but it seemed to have a flamingo-like beak. But in a paper published today in *Science Advances*, paleontologists reveal what was really going on—that "beak" is actually part of a hammerhead-shaped jaw apparatus, which it used to feed on plants on the ocean floor. It's the earliest known example of an herbivorous marine reptile.

"It's a very strange animal," says Olivier Rieppel, Rowe Family Curator of Evolutionary Biology at The Field Museum in Chicago. "It's got a hammerhead, which is unique, it's the first time we've seen a reptile like this." Rieppel co-authored the study with colleagues at National Museums Scotland and China's Institute of Vertebrate Paleontology and Paleoanthropology and the Wuhan Centre of the China Geological Survey.

The reptile's name, *Atopodentatus unicus*, hints at its muddled past—it's Latin for "unique strangely toothed." But newly discovered fossils make it clearer how its "strange teeth" were actually configured. Its wide jaw was shaped like a hammerhead, and along the edge, it had peg-like teeth. Then, further into its mouth, it had bunches of needle-like teeth.

"To figure out how the jaw fit together and how the animal actually fed, we bought some children's clay, kind of like Play-Doh, and rebuilt it with toothpicks to represent the teeth," says Rieppel. "We looked at how the upper and lower jaw locked together, and that's how we proceeded and described it."



To determine the way that *Atopodenatus unicus*'s jaw worked, the scientists made models out of children's clay and toothpicks. Credit: © Olivier Rieppel, The Field Museum

The verdict: *Atopodentatus unicus* used its bizarre jaw to help it eat [plants](#). "It used the peg-like front teeth to scrape plants off of rocks on the sea floor, and then it opened its mouth and sucked in the bits of plant material. Then, it used its needle-like [teeth](#) as a sieve, trapping the plants and letting the water back out, like how whales filter-feed with their baleen," explains Rieppel.

Not only does this discovery solve the mystery of the strange-toothed

animal, but it also provides us with an example of the first herbivorous marine reptile. "The jaw structure is clearly that of an herbivore," says Rieppel. "It has similarities to other marine animals that ate plants with a filter-feeding system, but *Atopodentatus* is older than them by about eight million years."



Fossil and reconstruction of *Atopodentatus unicus*. Credit: Institute of Vertebrate Paleontology and Paleoanthropology (IVPP) of the Chinese Academy of Sciences

*Atopodentatus* also helps tell a bigger story about the world's largest mass extinction 252 million years ago. "Animals living the years surrounding the Permian-Triassic extinction help us see how life on earth reacted to that event," says Rieppel. "The existence of specialized animals like *Atopodentatus unicus* shows us that life recovered and diversified more quickly than previously though. And it's definitely a [reptile](#) that no one would have thought to exist—look at it, it's crazy!"

**More information:** The earliest herbivorous marine reptile and its remarkable jaw apparatus, *Science Advances*, [DOI: 10.1126/sciadv.1501659](#)

Provided by Field Museum

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