



Press Release, 29.08.2024

EMBARGO: 29.08.2024, 00:01 UHR MEST

Ancient Sea Cow Attacked by Multiple Predators

Remarkable fossil evidence of an ancient sea cow being preyed upon by not one, but two different predators – a crocodile and a shark – offers fresh insights into the predation tactics and food chain dynamics of millions of years ago.

In a new study on ancient predator-prey interactions, researchers from the University of Zurich, the Natural History Museum of Los Angeles County and Venezuelan institutions Museo Paleontológico de Urumaco and Universidad Nacional Experimental Francisco de Miranda have uncovered a rare instance of a single animal being attacked by multiple predators during the Early to Middle Miocene epoch, roughly 23 to 11.6 million years ago. The study reveals that a now extinct sea cow was first hunted by an ancient crocodile and later scavenged by a tiger shark in what is now northwestern Venezuela.

Ancient food chain interaction

Deep bite marks on the sea cow's snout indicate that the crocodile likely tried to suffocate its prey by grabbing it by the nose. Further large incisions suggest the crocodile then dragged and tore the sea cow, possibly executing a "death roll" – a behavior still seen in modern crocodiles. A tooth from a tiger shark, found near the sea cow's neck, along with shark bite marks across the skeleton, shows that the remains were later scavenged by the shark. The findings support the idea that ancient food chains operated similarly to those of today.

"Today, we often observe predator kills being scavenged by other animals, but finding fossil evidence of this behavior is rare," says lead author Aldo Benites-Palomino from the University of Zurich's Department of Paleontology. "While we've previously identified sperm whales being scavenged by multiple shark species, this new discovery highlights the importance of sea cows in the ancient food chain."

Though fossil evidence of food chain interactions exists, it is usually fragmentary and difficult to interpret. "Our findings provide a rare glimpse into the complex predator-prey relationships of the Miocene, offering one of the few records of multiple predators feeding on the same prey," Benites-Palomino adds.

Tip-off from local farmer

The fossils were discovered in the Early to Middle Miocene Agua Clara Formation, near Coro, Venezuela, during an expedition led by Marcelo R. Sanchez-Villagra, a co-author of the study. The team uncovered a partial skeleton, including part of a skull and eighteen vertebrae, from a site located 100 kilometers from previous fossil finds in the region. "We learned about the site from a local farmer who noticed some unusual rocks," says Sanchez-Villagra, who also serves as Director of Department of Paleontology and the Paleontological Collection at UZH. "The first fossils we found were parts of skulls, which turned out to be from sea cows – a surprising discovery."

Determining the age of the fossils required careful analysis of the site's geology and sediments. Excavating the skeleton took several visits and considerable effort due to the large size of the animal and the amount of sediment that had to be removed. The excellent preservation of the fossils, aided by the fine sediments they were embedded in, allowed the team to observe the predation evidence clearly. "After locating the site, we organized a paleontological rescue operation, which involved carefully extracting the fossils with full casing protection," Sanchez-Villagra explains. "The operation took about seven hours with a team of five, and preparing and restoring the cranial elements took several months."

Literature

Benites-Palomino, A., Aguirre-Fernández, G., Velez-Juarbe, J., Carrillo-Briceño, J. D., Sánchez, R., & Sánchez-Villagra, M. R. (2024) Trophic interactions of sharks and crocodylians with a sea cow (Sirenia) from the Miocene of Venezuela. *Journal of Vertebrate Paleontology*. DOI: [10.1080/02724634.2024.2381505](https://doi.org/10.1080/02724634.2024.2381505)

Contact

Aldo Benites Palomino
Department of Paleontology
University of Zurich
+41 76 244 34 12
E-mail: aldo.benitespalomino@uzh.ch

Gabriel Aguirre-Fernández
Department of Paleontology
University of Zurich
+41 44 634 21 48
E-mail: gabriel.aguirre@pim.uzh.ch

Marcelo Sánchez-Villagra
Department of Paleontology
University of Zurich
+41 44 634 23 42
E-mail: m.sanchez@pim.uzh.ch