

Bone eating worms dined on marine reptile carcasses

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Worm higgs. Credit: © Nick Higgs

A species of bone-eating worm that was believed to have evolved in

conjunction with whales has been dated back to prehistoric times when it fed on the carcasses of giant marine reptiles.

Scientists at Plymouth University found that *Osedax* - popularised as the 'zombie worm' - originated at least 100 million years ago, and subsisted on the bones of prehistoric reptiles such as plesiosaurs and [sea turtles](#).

Reporting in the Royal Society journal *Biology Letters* this month, the research team at Plymouth reveal how they found tell-tale traces of *Osedax* on plesiosaur fossils held in the Sedgwick Museum at the University of Cambridge.

Dr Nicholas Higgs, a Research Fellow in the Marine Institute, said the discovery was important for both understanding the genesis of the species and its implications for fossil records. "The exploration of the deep sea in the past decades has led to the discovery of hundreds of new species with unique adaptations to survive in extreme environments, giving rise to important questions on their origin and evolution through geological time." said Nicholas. "The unusual adaptations and striking beauty of *Osedax* worms encapsulate the alien nature of deep-sea life in public imagination.

"And our discovery shows that these bone-eating worms did not co-evolve with whales, but that they also devoured the skeletons of large [marine reptiles](#) that dominated oceans in the age of the dinosaurs. *Osedax*, therefore, prevented many skeletons from becoming fossilised, which might hamper our knowledge of these extinct leviathans."

The finger-length *Osedax* is found in oceans across the globe at depths of up to 4,000m, and it belongs to the Siboglinidae family of worms, which, as adults, lack a mouth and digestive system. Instead, they penetrate bone using root-like tendrils through which they absorb bone collagen and lipids that are then converted into energy by bacteria inside the

worm.

Typically they consume whale bones, prompting many scientists to believe that they co-evolved 45 million years ago, branching out from their cousins that used chemosynthesis to obtain food.

But Nicholas, and research lead Dr Silvia Danise, of Plymouth's School of Geography, Earth and Environmental Sciences, studied fossil fragments taken from a plesiosaur unearthed in Cambridge, and a sea turtle found in Burham, Kent.

Using a computed tomography scanner at the Natural History Museum - essentially a three-dimensional X-ray - they were able to create a computer model of the bones, and found tell-tale bore holes and cavities consistent with the burrowing technique of *Osedax*.

Dr Danise said: "The increasing evidence for *Osedax* throughout the oceans past and present, combined with their propensity to rapidly consume a wide range of vertebrate skeletons, suggests that *Osedax* may have had a significant negative effect on the preservation of marine vertebrate skeletons in the fossil record.

"By destroying vertebrate skeletons before they could be buried, *Osedax* may be responsible for the loss of data on marine vertebrate anatomy and carcass-fall communities on a global scale. The true extent of this 'Osedax effect', previously hypothesized only for the Cenozoic, now needs to be assessed for Cretaceous marine vertebrates."

More information: The paper, Mesozoic origin for the bone-eating *Osedax* worms, is available in the Royal Society journal *Biology Letters*: rsbl.royalsocietypublishing.org/.../1098/rsbl.2015.0072

Provided by University of Plymouth

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