

Bone-eating worms 30 million years old

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This 30 million year old rib fragment of a whale shows the circular boreholes (diameter: 0,5 mm) made by *Osedax*.

An international team of scientists led by the paleontologist Steffen Kiel at the University of Kiel, Germany, found the first fossil boreholes of the worm *Osedax* that consumes whale bones on the deep-sea floor. They conclude that "boneworms" are at least 30 Million years old. This result was published in the current issue of the scientific journal *Proceedings of the National Academy of Sciences* of the USA (*PNAS*, April 19, 2010).

Six years ago *Osedax* was first described based on specimens living on a whale carcass in 2891 m depth off California. Since then paleontologists have been searching for fossil evidence to pin down its geologic age. Now researchers at the Institute of Geosciences at the Christian-Albrechts-University at Kiel, Germany, found 30 Million year old whale bones with holes and excavations matching those of living *Osedax* in size and shape. The evidence of the boreholes and cavities made by the living [worms](#) was provided by Greg Rouse (Scripps Institution of

Oceanography), one of the original discoverers of *Osedax*.

To produce accurate images of the fossil boreholes, the bones were CT-scanned by the scientists. The fossil bones belong to ancestors of our modern baleen whales and their age was determined using so-called co-occurring index fossils. "The age of our fossils coincides with the time when whales began to inhabit the open ocean" explains Steffen Kiel, who has been working on the evolution and fossil history of deep-sea ecosystems for many years. Only from the open ocean dead whales could sink to the deep-sea floor where they served as food for the boneworms. "Food is extremely rare on the vast deep-sea floor and the concurrent appearance of these whales and *Osedax* shows that even hard whale bones were quickly utilized as food source", Steffen Kiel explains the relevance of their discovery.

The ancient bones were found by the American fossil collector Jim Goedert. He has been collecting [fossil](#) along the American Pacific coast for more than 30 years and is well known in the scientific community. Steffen Kiel says: "I got to know Jim when I was a PhD student, when he visited Hamburg University. We kept in touch ever since." By now, Steffen Kiel has done several field trips with Jim Goedert to the US Pacific coast, a geologically active area where fossil-rich sediments are continuously uplifted by plate tectonic processes.

Vertebrate paleontologists are probably less happy about the old age of *Osedax*: because it has been feeding on bones for most of the evolutionary history of whales, it is likely to have destroyed many potential whale fossils.

Provided by Kiel University

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