

Giants of the Jurassic seas were twice the size of a killer whale, says study

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An artist's impression of the pliosaurus. Credit: Megan Jacobs, University of Portsmouth

More than 20 years ago, the BBC's "Walking with Dinosaurs" TV documentary series showed a 25-meter-long Liopleurodon. This sparked heated debates over the size of this pliosaur as it was thought to have been wildly overestimated and more likely to have only reached an adult

size of just over six meters long.

The speculation was set to continue, but now a chance discovery in an Oxfordshire museum has led to University of Portsmouth paleontologists publishing a paper on a similar species potentially reaching a whopping 14.4 meters—twice the size of a killer whale. The research is published in the *Proceedings of the Geologists' Association*.

Professor David Martill from the University of Portsmouth's School of the Environment, Geography and Geosciences, said, "I was a consultant for the BBC's pilot program 'Cruel Sea' and I hold my hands up—I got the size of *Liopleurodon* horrendously wrong. I based my calculations on some fragmentary material which suggested a *Liopleurodon* could grow to a length of 25 meters, but the evidence was scant and it caused a lot of controversy at the time.

"The size estimate on the BBC back in 1999 was overdone, but now we have some evidence that is much more reliable after a serendipitous discovery of four enormous vertebrate."

Professor Martill's co-author, Megan Jacobs, was photographing an ichthyosaur skeleton at Abingdon County Hall Museum, while Dave looked through drawers of fossils. He found a large vertebra and was thrilled to discover the curator had three more of them in storage.

The vertebrae are clearly identifiable as being closely related to a *Pliosaurus* species or similar animal. Pliosaurus were like plesiosaurs, but with a bigger elongated head, similar to a crocodile, and a shorter neck. They had four flippers, which acted as powerful paddles to propel them through water and a relatively short tail.

After conducting topographic scans, Professor Martill and colleagues calculated this Late Jurassic [marine reptile](#) could have grown to between

9.8 and 14.4 meters long.

He said, "We know these pliosaurs were very fearsome animals swimming in the seas that covered Oxfordshire 145–152 million years ago. They had a massive skull with huge protruding teeth like daggers—as big, if not bigger than a T. rex, and certainly more powerful.

"They were at the top of the marine food chain and probably preyed on ichthyosaurs, long-necked plesiosaurs and maybe even smaller marine crocodiles, simply by biting them in half and taking chunks off them. We know they were massacring smaller marine reptiles because you can see [bite marks](#) in ichthyosaur bones in examples on display in The Etches Collection in Dorset."

The vertebrae were originally discovered during temporary excavations at Warren Farm in the River Thames Valley in Oxfordshire and come from the Kimmeridge Clay Formation. This deposit is Late Jurassic in age, around 152 million years old.

Professor Martill added, "It's wonderful to prove there was indeed a truly gigantic pliosaur species in the Late Jurassic seas. Although not yet on a par with the claims made for *Liopleurodon* in the iconic BBC TV series *Walking With Dinosaurs*, it wouldn't surprise me if one day we find some clear evidence that this monstrous species was even bigger."

More information: David M. Martill et al, A truly gigantic pliosaur (Reptilia, Sauropterygia) from the Kimmeridge Clay Formation (Upper Jurassic, Kimmeridgian) of England, *Proceedings of the Geologists' Association* (2023). [DOI: 10.1016/j.pgeola.2023.04.005](https://doi.org/10.1016/j.pgeola.2023.04.005)

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