

Early elephant 'was amphibious'



Moeritherium - an early elephant which we now know had an amphibious hippo-like lifestyle. Image: Luci Betti-Nash/Stony Brook University.

An ancient relative of today's elephants lived in water, a team led by an Oxford University scientist has found.

The scientists were investigating the lifestyle of two early elephants (proboscideans) Moeritherium and Barytherium that lived in the Eocene period, over 37 million years ago. By analysing isotopes in tooth enamel from Moeritherium they were able to deduce that it was very likely a semi-aquatic mammal, spending its days in water eating freshwater plants.'

We know from molecular data that modern elephants share a common ancestry with the sirenians - aquatic sea cows and dugongs,' said Alexander Liu of Oxford's Department of Earth Sciences, lead author of a report of the research published online in *PNAS* this week. 'It suggests that elephants may have an ancestor which was amphibious in its mode of life and we wanted to know if Moeritherium or Barytherium was this semi-aquatic ancient relative. Unfortunately only fragments of the skeletons of these early elephants survive, so instead of looking at their bones we looked at the chemical composition of their teeth to determine what they ate and how they lived.'

Alex Liu, with colleagues Erik Seiffert from Stony Brook University (USA) and Elwyn Simons from the Duke Lemur Center (USA), analysed the oxygen and carbon isotope ratios contained within tooth enamel from both extinct proboscideans.

While carbon isotopes can give clues as to an animal's diet, oxygen isotopes found in teeth come from local water sources - and variations in the ratios of these isotopes can indicate the type of environment the animal lived in. They compared the ratios of these isotopes to definitely terrestrial animals from the same period and these results - when combined with results from studies of embryology, molecular data, and sedimentology - lead them to believe that Moeritherium was semi-aquatic.

Alex Liu commented: 'We now have substantial evidence to suggest that modern elephants do have ancient relatives which lived primarily in water. The next steps are to conduct similar analyses on other elephant ancestors to determine when the switch from water to land occurred, and to determine exactly when the now fully-aquatic sirenians split from their semi-aquatic proboscidean relatives.'

Source: Oxford University

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