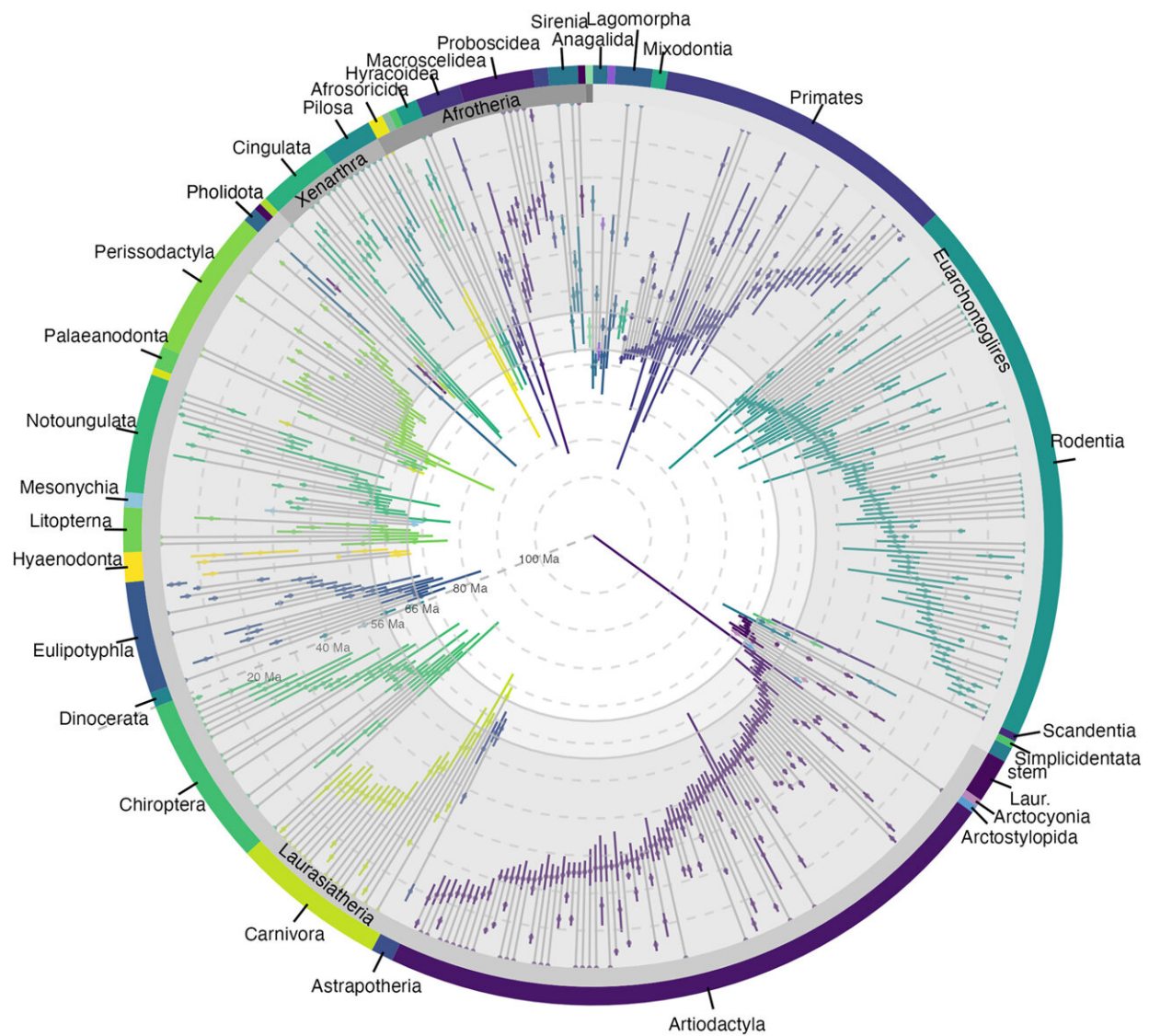


Humans' ancestors survived the asteroid impact that killed the dinosaurs, shows fossil record analysis

June 27 2023



Clade age and extinction time estimates for placental mammal families. Each line represents a family (arranged by order and clade but without further phylogenetic information), with 95% credible intervals in colors at the root estimates and extinction estimates (where applicable). Gray lines fill in the lineage. 93 families have credible intervals extending into the Cretaceous, but many originated after the K-Pg boundary. Credit: *Current Biology* (2023). DOI: 10.1016/j.cub.2023.06.016

A Cretaceous origin for placental mammals, the group that includes humans, dogs and bats, has been revealed by in-depth analysis of the fossil record, showing they co-existed with dinosaurs for a short time before the dinosaurs went extinct.

The catastrophic destruction triggered by the asteroid hitting the Earth resulted in the death of all non-avian dinosaurs in an event termed the Cretaceous-Paleogene (K-Pg) [mass extinction](#). Debate has long raged among researchers over whether [placental mammals](#) were present alongside the dinosaurs before the mass [extinction](#), or whether they only evolved after the dinosaurs were done away with.

Fossils of placental mammals are only found in rocks younger than 66 million years old, which is when the asteroid hit Earth, suggesting that the group evolved after the mass extinction. However, [molecular data](#) has long suggested an [older age](#) for placental mammals.

In a new paper published in the journal *Current Biology*, a team of paleobiologists from the University of Bristol and the University of Fribourg used statistical analysis of the [fossil record](#) to determine that placental mammals originated before the mass extinction, meaning they co-existed with dinosaurs for a short time. However, it was only after the [asteroid impact](#) that modern lineages of placental mammals began to evolve, suggesting that they were better able to diversify once the

dinosaurs were gone.

The researchers collected extensive fossil data from placental [mammal](#) groups extending all the way back to the mass extinction 66 million years ago.

Lead author Emily Carlisle of Bristol's School of Earth Sciences said, "We pulled together thousands of fossils of placental mammals and were able to see the patterns of origination and extinction of the different groups. Based on this, we could estimate when placental mammals evolved."

Co-author Daniele Silvestro (University of Fribourg) explained, "The model we used estimates origination ages based on when lineages first appear in the fossil record and the pattern of species diversity through time for the lineage. It can also estimate extinction ages based on last appearances when the group is extinct."

Co-author Professor Phil Donoghue, also from Bristol, added, "By examining both origins and extinctions, we can more clearly see the impact of events such as the K-Pg mass extinction or the Paleocene-Eocene Thermal Maximum (PETM)."

Primates, the group that includes the human lineage, as well as Lagomorpha (rabbits and hares) and Carnivora (dogs and cats) were shown to have evolved just before the K-Pg mass extinction, which means their ancestors were mingling with dinosaurs. After they survived the asteroid impact, placental mammals rapidly diversified, perhaps spurred on by the loss of competition from the dinosaurs.

More information: Emily Carlisle et al, A timescale for placental mammal diversification based on Bayesian modeling of the fossil record, *Current Biology* (2023). [DOI: 10.1016/j.cub.2023.06.016](https://doi.org/10.1016/j.cub.2023.06.016)

Provided by University of Bristol

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