

DINOSAURS AND MAMMALS

They just needed some leg room: new research shows the great dinosaur die-off made way for mammals to explode in size - some more massive than several elephants put together.

The largest land mammal ever: A rhinoceros-like creature, minus the horn, that stood 18 feet tall, weighed roughly 17 tons and grazed in forests in what is now Eurasia. It makes the better known woolly mammoth seem a bit puny. Tracking such prehistoric giants is more than a curiosity: It sheds new light on the evolution of mammals as they diversified to fill habitats left vacant by the dinosaurs.

Within 25 million years of the dinosaurs' extinction -- fast, in geologic terms -- overall land mammals had reached a maximum size and then leveled off, an international team of scientists reports Friday in the journal *Science*. And while different species on different continents reached their peaks at different points in time, that pattern of evolution was remarkably similar worldwide. "Evolution can happen very quickly when ecology permits," said paleoecologist Felisa Smith of the University of New Mexico, who led the research. "This is really coming down to ecology allowing this to happen."

Anyone who frequents natural history museums knows that the end of the dinosaurs 65 million years ago ushered in the age of mammals, and that some of them were gigantic. But the new study is the first comprehensive mapping of these giants in a way that helps explain how and why their size evolved. Previous theories suggested that species diversity drove increases in size, but the new study didn't find that connection. "It suggests there's a deeper explanation of how large body size evolves in mammals," she said.

Mammals did coexist with dinosaurs, but small ones, ranging from about the size of a mouse to a maximum of a small dog. To see how that changed, researchers collected fossil data on the maximum sizes attained by all major groups of mammals on each continent throughout their evolutionary history. How do they know the sizes? Smith said mammal teeth not only tend to preserve better than bones, but they correlate very well to body mass.

Why did mammal size level off? Available land area and the earth's temperature, Smith said. Ninety percent of the food mammals eat goes to maintaining their core body temperature, and the amount of food is related to the amount of land supporting a population. The biggest mammals evolved when a cooler climate meant lower sea levels and more land area. Also, bigger animals conserve heat better, a problem when temperatures rise.

Scientists right now are debating if climate change or early humans eventually ended the age of giant mammals, something the new study doesn't address.

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