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## Modern snakes evolved from a few survivors of a dino-killing asteroid

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**Love them or loathe them, there is now new information that suggests that snakes have an even more intriguing origin story than previously thought.**

The ancestors of the modern snake may have been among the few reptiles to survive the giant asteroid catastrophe that erased dinosaurs from the face of the Earth at the end of the Cretaceous – a period in time that began 145 million years ago and ended 66 million years ago.

New revelations in a recent study have shed more light on the evolution of snakes, including the point in time when they evolved and diversified.

The study claims all modern snakes, like tree and sea snakes, vipers, cobras and pythons, evolved from ancestors that found a way to survive the most devastating period in the Earth's existence – a time when poisonous gases filled the air and the Sun disappeared from the sky.

From this point of destruction, snakes began to diversify and adapt to different ecosystems because of the gap left behind by predators that went extinct in the aftermath of the asteroid impact. It was a phenomenon experts termed “creative destruction”.

Scientists at the University of Bath, together with fellow researchers in Cambridge, Bristol and Germany analysed fossils and studied the genetic differences between modern snakes. By doing this they were able to reconstruct snake evolution. Their findings show that snakes survived the mass extinction that the dinosaurs and thousands of other species of animals suffered.

“It's remarkable, because not only are they surviving an extinction that wiped out so many other animals, but within a few million years they are innovating, using their habitats in new ways,” said Dr Catherine Klein, lead author from Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) in Germany.

What this study also reveals is that survivors of the mass extinction were able to diversify and explore new territories and ecosystems, learning new habits and behaviours and filling the gaps left behind by the missing species.

It is this “creative destruction” that fascinates scientists today who have observed that greater diversity follows a period of massive destruction.

Dr Nick Longrich, from the Milner Centre for Evolution at the University of Bath and the corresponding author, said: “It's the periods immediately after major extinctions where we see evolution at its most wildly experimental and innovative.”

Longrich described creative destruction as a reversal of the Marxist idea that by creating things, other things are destroyed. “The destruction of biodiversity makes room for new things to emerge and colonize new landmasses. Ultimately life becomes even more diverse than before,” Longrich explained. “I suspect one of the key drivers of evolution is actually extinction. It shakes things up.”

It seems miraculous that snakes somehow managed to survive the asteroid hit in the first place, but they did, adapting and evolving into the colourful and varied species we see today. There are an estimated 4000 species of snakes on the planet, and if it hadn't been for the Cretaceous mass extinction we may not have had snakes at all today.

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South Africa is home to some of the most diverse species of snakes in the world like the Black Mamba, Cape Cobra and the Puff Adder, among about 160 species found in the country. Brazil is credited with having the most species of snakes in the world, while Australia is renowned for having the most dangerous snakes.

After the impact of the asteroid, the Earth was covered in dust and soot which blocked out the Sun and led to a global collapse in photosynthesis, causing the death of animals and plants as the planet became consumed by darkness.

Snakes were able to escape the harshest of conditions because of their burrowing habits. They avoided the cold by staying underground for longer periods of time. They didn't need to feed as often as other animals and they were able to hunt in darkness. Snakes, it would appear, are the real ultimate survivors in the natural world.

The study also revealed that as few as six snake lineages may have survived the asteroid event 66 million years ago. The surviving snakes diversified into the vipers, boas and cobras we know today. Many of them spread eastwards to Asia, and were able to thrive in that post-extinction world in the "niches" created by the absence of other animals.

Scientists believe that this latest study will help them better understand the nature of evolution and what is the driving force of life; questions that have been asked for centuries.

"When you eliminate a huge number of species, you end up with a lot of empty niches," Longrich told Inverse. "When you wipe out huge numbers of species, it sort of resets things, and evolution goes off in strange new directions, producing odd things, like human beings."