

India's ancient mammals survived multiple pressures

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Leopard in southern India.

Most of the mammals that lived in India 200,000 years ago still roam the subcontinent today, in spite of two ice ages, a volcanic super-eruption and the arrival of people, a study reveals.

In contrast, nearly two-thirds of [mammals](#) in northern Eurasia, Australia, Madagascar and the Americas died out by 10,000 years ago.

The findings suggest that many of India's charismatic animals, such as bears, leopards and wolves, may have been more able to adapt to ecological pressures than mammals elsewhere.

They also highlight the importance of connected habitats and could help protect some of today's most endangered Indian creatures.

Researchers think India's mammals survived crises by moving between connected safe havens, known as refugia. More stable weather in the area over the last 200,000 years compared to other parts of the world could also have played a part in the mammals' persistence.

Until now, many researchers thought widespread extinctions affecting far-apart places like North America, Europe and Australia must have been worldwide phenomena, caused by single problems like climate change or overhunting.

But this latest study adds to the growing body of evidence suggesting that extinctions may instead be the result of multiple pressures.

'Most of the research on mega-faunal extinctions over the last 30 or 40 years has focused on North America, Australia and Madagascar, so that has shaped our thinking on the topic. These places saw much more extremes of climate change than the Indian subcontinent did. These and human factors may have led to big changes in faunal populations,' says Professor Michael Petraglia of the University of Oxford, who led the study.

'But it now seems that major extinctions during the Late Pleistocene weren't a worldwide phenomenon after all, which was surprising,' he adds.

The study, published in *Proceedings of the National Academy of Sciences*, aimed to find out how [climate change](#) and the first influx of people affected some of the bigger mammals on the Indian subcontinent. This was probably one of the first regions reached by early modern humans leaving Africa in the Late Pleistocene.

The researchers painstakingly identified and dated animal fossils from ancient sediments from caves in southern India. Some of the caves'

chambers contain ten-metre-thick sediments, made up of layers of mud slowly deposited over thousands of years. These provide a glimpse into the past, revealing details about which animals lived when.

Researchers have built such timelines for the Americas, Europe and Australasia, but not, until now, for the Indian subcontinent.

Petraglia and his colleagues found that 20 of 21 mammal groups from at least 100,000 years ago are still in India today.

'We managed to successfully date this long sequence going back 200,000 years. We saw a broad-scale continuity of fauna and in the wider perspective, our findings conflicted with other major extinction events,' says Petraglia.

'The relative stability of rainfall and topography across the Indian subcontinent as a whole meant that habitat survival in patches facilitated faunal recombination, migration, and general long-term persistence,' write the authors.

More information: Patrick Roberts, Eric Delson, Preston Miracle, Peter Ditchfield, Richard G. Roberts, Zenobia Jacobs, James Blinkhorn, Russell L. Ciochon, John G. Fleagle, Stephen R. Frost, Christopher C. Gilbert, Gregg F. Gunnell, Terry Harrison, Ravi Korisettar, and Michael D. Petraglia, "Continuity of mammalian fauna over the last 200,000 y in the Indian subcontinent," *Proceedings of the National Academy of Sciences*, published 7th April 2014, www.pnas.org/cgi/doi/10.1073/pnas.1323465111

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