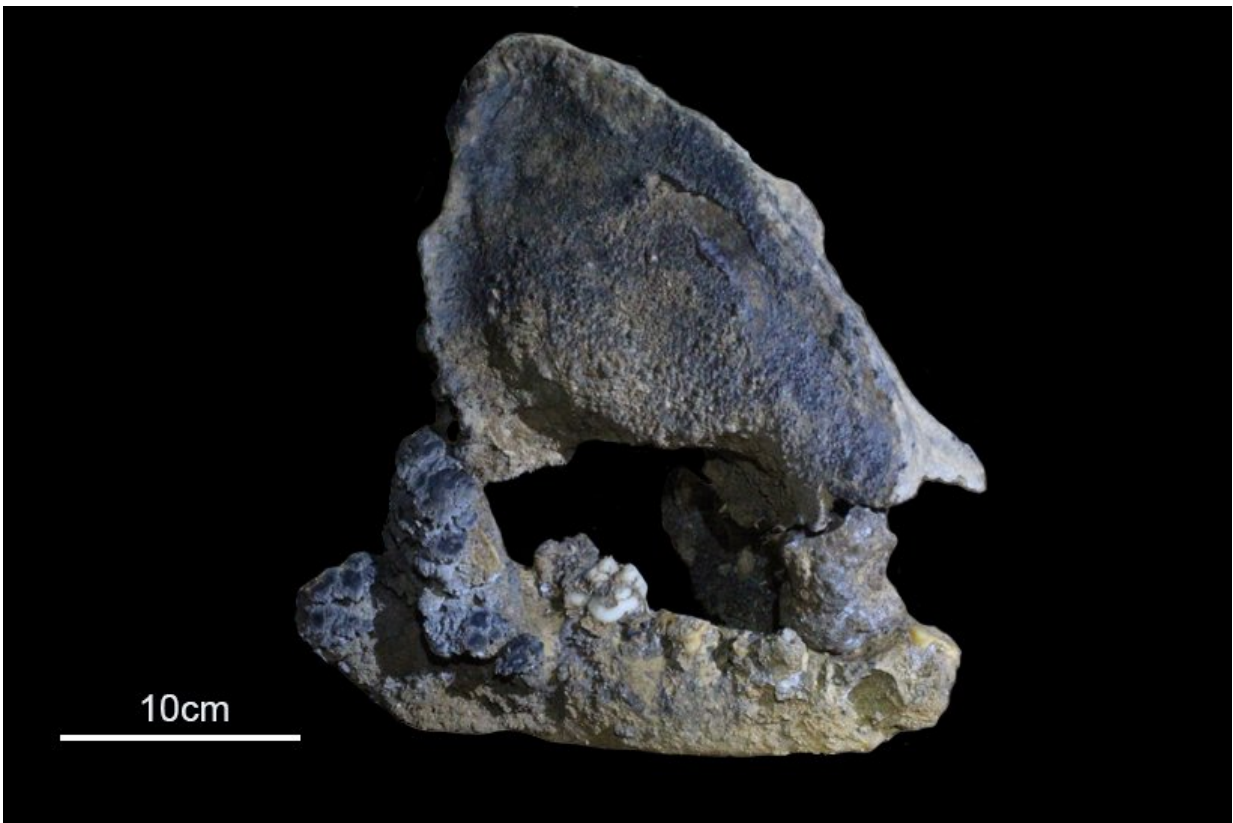


## 22,000-year-old panda from cave in Southern China belongs to distinct, long-lost lineage

June 18 2018

---



Photograph of the Cizhutuo fossil. Credit: Yingqi Zhang and Yong Xu

Researchers who've analyzed ancient mitochondrial (mt)DNA isolated from a 22,000-year-old panda found in Cizhutuo Cave in the Guangxi Province of China—a place where no pandas live today—have revealed

a new lineage of giant panda. The report, published in *Current Biology* on June 18, shows that the ancient panda separated from present-day pandas 144,000 to 227,000 years ago, suggesting that it belonged to a distinct group not found today.

The newly sequenced mitochondrial [genome](#) represents the oldest DNA evidence from pandas.

"Using a single complete mtDNA sequence, we find a distinct mitochondrial lineage, suggesting that the Cizhutuo panda, while genetically more closely related to present-day pandas than other bears, has a deep, separate history from the common ancestor of present-day pandas," says Qiaomei Fu from the Chinese Academy of Sciences. "This really highlights that we need to sequence more DNA from ancient pandas to really capture how their genetic diversity has changed through time and how that relates to their current, much more restricted and fragmented habitat."

Very little has been known about pandas' past, especially in regions outside of their current range in Shaanxi province or Gansu and Sichuan provinces. Evidence suggests that pandas in the past were much more widespread, but it's been unclear how those pandas were related to pandas of today.

In the new study, the researchers used sophisticated methods to fish mitochondrial DNA from the ancient cave specimen. That's a particular challenge because the specimen comes from a subtropical environment, which makes preservation and recovery of DNA difficult.



Photograph of the Cizhutuo cave. Credit: Yingqi Zhang

The researchers successfully sequenced nearly 150,000 DNA fragments and aligned them to the [giant panda](#) mitochondrial genome reference sequence to recover the Cizhutuo panda's complete mitochondrial genome. They then used the new genome along with mitochondrial genomes from 138 present-day bears and 32 ancient bears to construct a family tree.

Their analysis shows that the split between the Cizhutuo panda and the ancestor of present-day pandas goes back about 183,000 years. The Cizhutuo panda also possesses 18 mutations that would alter the structure of proteins across six mitochondrial genes. The researchers say those

amino acid changes may be related to the ancient panda's distinct habitat in Guangxi or perhaps climate differences during the Last Glacial Maximum.

The findings suggest that the ancient panda's maternal lineage had a long and unique history that differed from the maternal lineages leading to present-day panda populations. The researchers say that their success in capturing the mitochondrial genome also suggests that they might successfully isolate and analyze DNA from the ancient specimen's much more expansive nuclear genome.

"Comparing the Cizhutuo panda's nuclear DNA to present-day genome-wide data would allow a more thorough analysis of the evolutionary history of the Cizhutuo specimen, as well as its shared history with present-day pandas," Fu says.

**More information:** *Current Biology*, Ko et al.: "Mitochondrial genome of a 22,000-year-old giant panda from southern China reveals a new panda lineage" [www.cell.com/current-biology/f...](http://www.cell.com/current-biology/fulltext/S0960-9822(18)30610-9)  
[0960-9822\(18\)30610-9](http://www.cell.com/current-biology/fulltext/S0960-9822(18)30610-9) , DOI: [10.1016/j.cub.2018.05.008](https://doi.org/10.1016/j.cub.2018.05.008)

Provided by Cell Press

Citation: 22,000-year-old panda from cave in Southern China belongs to distinct, long-lost lineage (2018, June 18) retrieved 29 April 2024 from <https://phys.org/news/2018-06-year-old-panda-cave-southern-china.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.