

Europe's last hunter-gatherers were more diverse than thought, DNA evidence suggests

March 14 2019



Photograph of the Cueva de Chaves Neolithic site. Credit: Museo de Huesca

The genetic legacy of European hunter-gatherers who lived thousands of

years ago is more complex than had been thought, according to new genomic evidence reported in *Current Biology* on March 14. The new findings point to more diversity and mixture amongst hunter-gatherers, especially in the Iberian Peninsula of Southwestern Europe now recognized as Portugal and Spain, who had endured the Last Glacial Maximum (18,000-24,000 years ago) in southern refugia.

"We can confirm the survival of an additional Paleolithic lineage that dates back to the Late Ice Age in Iberia," says Wolfgang Haak of the Max Planck Institute for the Science of Human History. "This confirms the role of the Iberian Peninsula as a refuge during the Last Glacial Maximum, not only for fauna and flora but also for [human populations](#)."

Earlier evidence has shown that western and central Europe were dominated by [ancestry](#) associated with an ~14,000-year-old individual from Villabruna, Italy. That ancestry had largely replaced earlier ancestry more closely represented by 19,000-15,000-year-old individuals associated with what's known as the Magdalenian cultural complex.

But little was known about the [genetic diversity](#) in southern European refugia, including the Iberian Peninsula. To help fill in those gaps, Haak and colleagues including Ph.D. student Vanessa Villalba now report new genome-wide data from 11 hunter-gatherers and Neolithic individuals from Iberia. The oldest are ~12,000-year-old individuals from Balmà Guilanyà in Spain.



The Balma Guilanyà Neolithic site. Credit: CEPAP-UAB

The evidence shows that those individuals, including the oldest ~19,000-year-old previously published individual from El Mirón, carry dual ancestry from both Villabruna and the Magdalenian-related individuals. The discovery suggests an early connection between two potential refugia, they report, resulting in a genetic ancestry that survived in later Iberian hunter-gatherers.

"The hunter-gatherers from the Iberian Peninsula carry a mix of two older types of genetic ancestry: one that dates back to the Last Glacial Maximum and was once maximized in individuals attributed to Magdalenian culture and another one that is found everywhere in western and central Europe and had replaced the Magdalenian lineage during the Early Holocene, with the exception of the Iberian Peninsula," Haak says.

The findings come as something of a surprise because archaeologists had described distinct cultural changes appearing with the Holocene hunter-gatherers. The genetic evidence tells a somewhat different story, highlighted by an almost stable blend of two ancient source populations.



Work in progress at the Balma Guilanyà Neolithic site. Credit: CEPAP-UAB

"At the same time, we can show that this genetic ancestry is also present in Early European farmers who expanded during the Neolithic period across Europe," Villalba says. "The fact that we can trace both hunter-gatherer lineages tells us that the newbies picked up this ancestry by mixing with the locals in Iberia."

"The signs of mixing between local [hunter-gatherers](#) and newly arriving farmers is fantastic to witness, even though we have virtually no overlap in the radiocarbon record in many areas of Iberia," she continues. "It just

shows how much of the past we are still missing."

The researchers say that continued efforts to decipher the genetic structure of late hunter-gatherer groups across Europe will help to even better understand Europe's past and, in particular, the assimilation of a Neolithic way of life brought about by expanding farmers from the Near East during the Holocene. They plan to continue adding genomic data for ancient people to reconstruct the most detailed account of each region and epoch as possible.

More information: *Current Biology*, Villalba-Mouco et al.: "Survival of Late Pleistocene Hunter-gatherer ancestry in the Iberian Peninsula" [www.cell.com/current-biology/fulltext/S0960-9822\(19\)30145-9](https://www.cell.com/current-biology/fulltext/S0960-9822(19)30145-9) , DOI: [10.1016/j.cub.2019.02.006](https://doi.org/10.1016/j.cub.2019.02.006)

Provided by Cell Press

Citation: Europe's last hunter-gatherers were more diverse than thought, DNA evidence suggests (2019, March 14) retrieved 8 March 2024 from <https://phys.org/news/2019-03-europe-hunter-gatherers-diverse-thought-dna.html>

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