

# Study of ancient dog DNA traces canine diversity to the Ice Age

October 29 2020



Veretye dog image. Credit: E.E. Antipina

A global study of ancient dog DNA, led by scientists at the Francis Crick Institute, University of Oxford, University of Vienna and archaeologists from more than 10 countries, presents evidence that there were different types of dogs more than 11,000 years ago in the period immediately following the Ice Age.

In their study, published in *Science* today, the research team sequenced ancient DNA from 27 dogs, some of which lived up to nearly 11,000 years ago, across Europe, the Near East and Siberia. They found that by this point in history, just after the Ice Age and before any other animal had been domesticated, there were already at least five different types of dog with distinct genetic ancestries.

This finding reveals that the diversity observed between dogs in different parts of the world today originated when all humans were still hunters and gatherers.

Pontus Skoglund, author and group leader of the Crick's Ancient Genomics laboratory, says: "Some of the variation you see between dogs walking down the street today originated in the Ice Age. By the end of this period, dogs were already widespread across the [northern hemisphere](#)."

This study of ancient genomics involves extracting and analysing DNA from skeletal material. It provides a window into the past, allowing researchers to uncover evolutionary changes that occurred many thousands of years ago.

The team showed that over the last 10,000 years, these early dog lineages mixed and moved to give rise to the dogs we know today. For example, early European dogs were initially diverse, appearing to originate from two highly distinct populations, one related to Near Eastern dogs and another to Siberian dogs. However, at some point this diversity was lost, as it is not present in European dogs today.

Anders Bergström, lead author and post-doctoral researcher in the Ancient Genomics laboratory at the Crick, says: "If we look back more than four or five thousand years ago, we can see that Europe was a very diverse place when it came to dogs. Although the European dogs we see today come in such an extraordinary array of shapes and forms, genetically they derive from only a very narrow subset of the diversity that used to exist."

The researchers also compared the evolution in dog history to changes in [human evolution](#), lifestyles and migrations. In many cases comparable changes took place, likely reflecting how humans would bring their dogs with them as they migrated across the world.

But there are also cases when human and dog histories do not mirror each other. For example, the loss of diversity that existed in dogs in early Europe was caused by the spread of a single dog ancestry that replaced other populations. This dramatic event is not mirrored in human populations, and it remains to be determined what caused this turnover in European dog ancestry.

Greger Larson, author and Director of the Palaeogenomics and Bio-Archaeology Research Network at the University of Oxford, says: "Dogs are our oldest and closest animal partner. Using DNA from ancient dogs is showing us just how far back our shared history goes and will ultimately help us understand when and where this deep relationship began."

Ron Pinhasi, author and group leader at the University of Vienna, says: "Just as ancient DNA has revolutionised the study of our own ancestors, it's now starting to do the same for dogs and other domesticated animals. Studying our animal companions adds another layer to our understanding of human history."

While this study provides major new insights into the early history of dog populations and their relationships with humans and each other, many questions still remain. In particular, research teams are still trying to uncover where and in which human cultural context, [dogs](#) were first domesticated.

**More information:** A. Bergström et al., "Origins and genetic legacy of prehistoric dogs," *Science* (2020). [science.sciencemag.org/cgi/doi ... 1126/science.aba9572](https://science.sciencemag.org/cgi/doi/10.1126/science.aba9572)

"Of dogs and men," *Science* (2020). [science.sciencemag.org/cgi/doi ... 1126/science.abe7823](https://science.sciencemag.org/cgi/doi/10.1126/science.abe7823)

Provided by The Francis Crick Institute

Citation: Study of ancient dog DNA traces canine diversity to the Ice Age (2020, October 29) retrieved 28 April 2024 from <https://phys.org/news/2020-10-ancient-dog-dna-canine-diversity.html>

<p>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.</p>
--