

No signs of incest in new Neanderthal woman genome

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A handout photo released by Paleoanthropology Group MNCN-CSIC shows the upper jaw of Neanderthal El Sidron 1, found in what is today Spain

A complete genetic analysis of a Neanderthal woman whose remains were found in a cave in Croatia shows no apparent incest in her ancestry, contrary to a previous specimen, researchers said Thursday.

As only the second Neanderthal to undergo full, high-quality genome

sequencing, the findings in the journal *Science* offer a broader picture of our extinct ancestors, and also uncovered 16 new Neanderthal gene variants that were passed on to [modern humans](#).

The results confirm some things that were already known, including that Neanderthals lived in small, isolated populations and inter-bred with *Homo sapiens* who had migrated north from Africa.

The latest genome comes from a Neanderthal woman who lived about 52,000 years ago in what is today Eastern Europe.

Until now, the only high-quality Neanderthal genome came from an individual in the Altai mountains of Siberia, dating back about 122,000 years.

The Altai Neanderthal's genes showed that her parents had been related, perhaps on the level of half-siblings or an aunt-nephew or uncle-niece pairing.

"The Altai Neanderthal lived in a small group of close relatives—and was the kid of close relatives—and many people thought that this was the typical Neanderthal behavior," said Marcia Ponce de Leon, collection curator and senior lecturer at the Anthropological Institute and Museum, University of Zurich.

However, the present study shows that Neanderthals from the area of Vindija, Croatia, "lived in much more open groups, probably similar to what we know from modern hunter-gatherers," she told AFP in an email, praising the work for its "important new insights."

Neanderthals disappeared from the Earth about 35,000 years ago. Just what forced them into extinction is a mystery, but they were known to be living in relatively small groups of around 3,000 people.

Long caricatured as dim-witted cave dwellers, researchers now know that Neanderthals practised rituals, decorated jewelry, cared for elders, used primitive medicines—and may have resorted to cannibalism.

Lead author Kay Prüfer said he was most surprised to discover that the two high-quality specimens appeared to have been closely related themselves, despite vast distances of geography and time.

"This shows that Neanderthals must have had a small population size," he told AFP.

DNA insights

A second paper in *Science* analyzed the genomes of four anatomically modern humans who lived around 34,000 years ago and were found at the Sungir burial site, in Russia.

The four males were not related to each other, and their genes showed no signs of inbreeding, suggesting that these hunter-gatherers mated outside their clans.

"They have a population structure that appears to be really outbred compared to Neanderthals, and that may have something to do with why modern humans succeeded—we were able to maintain broader social networks," explained John Hawks, professor of anthropology at the University of Wisconsin Madison.

Hawks, who was not involved in the research, said the work "is not transforming the way we look at Neanderthals, but it is giving us a much better ability to look at what they shared with us."

The latest genome is closer to the human mixture than the older one and includes "new gene variants in the Neandertal genome that are influential

in modern day humans," said the report.

These include variants related to plasma levels of bad (LDL) cholesterol and vitamin D, eating disorders, fat accumulation, rheumatoid arthritis, schizophrenia and responses to antipsychotic drugs, said the report.

Researchers also now believe that Neanderthal DNA is slightly more prevalent in modern people—with the exception of Africans whose ancestors did not breed with Neanderthals—than previously thought.

Most non-African people today carry between 1.8-2.6 percent Neanderthal DNA, higher than earlier estimates of 1.5-2.1 percent, researchers said.

"East Asians carry somewhat more Neanderthal DNA (2.3-2.6 percent) than people in Western Eurasia (1.8-2.4 percent)," said the report.

As to the reported Neanderthal links to disease, Ponce de Leon urged skepticism.

"In my view, this is a statistical artifact resulting from the fact that [genome](#) sequencing has a strong clinical bias. As an effect, disease-related genes get into the focus of interest," she said in an email.

"However, the 'obesity/arthritis/schizophrenia-causing Neanderthal' is likely more fiction than fact."

More information: K. Prüfer et al., "A high-coverage Neanderthal genome from Vindija Cave in Croatia," *Science* (2017).
science.sciencemag.org/lookup/.../1126/science.aao1887

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