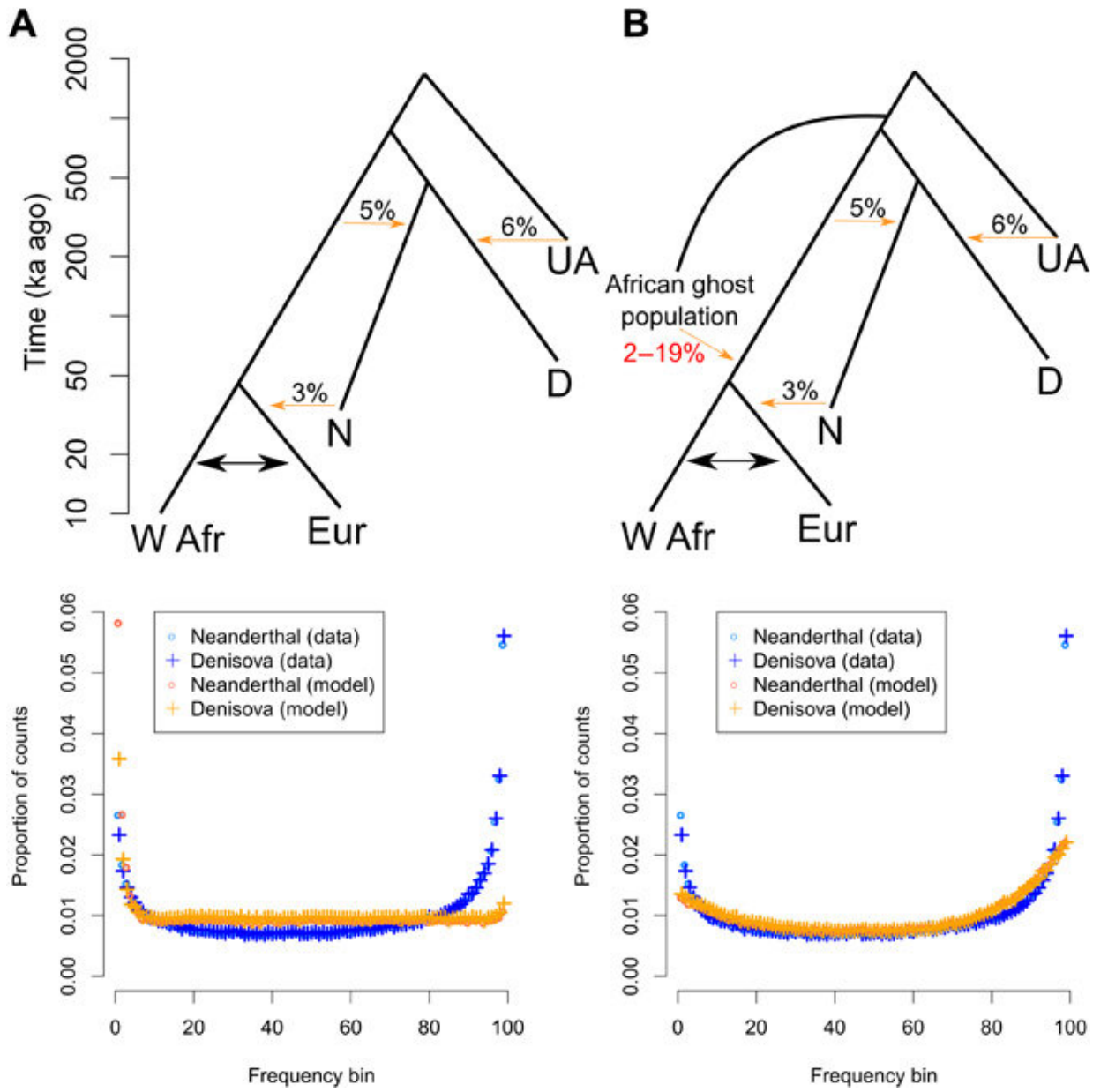
'Ghost' DNA found in some West African people

February 13 2020, by Bob Yirka



Demography relating known and proposed archaic lineages to modern human populations. (A) Basic demographic model with CSFS fit. W Afr, West Africans; Eur, European; N, Neanderthal; D, Denisovan; UA, unknown archaic [see (18)]. Below, we show the CSFS in the West African YRI when restricting to SNPs where a randomly sampled allele from the high-coverage Vindija Neanderthal was observed to be derived [Neanderthal (data)], as well as where a randomly sampled allele from the high-coverage Denisovan genome was observed to be derived [Denisovan (data)]. We also show the CSFS under the proposed model [Neanderthal (model) and Denisova (model)]. Migration between Europe and West Africa introduces an excess of low-frequency variants but does not capture the decrease in intermediate frequency variants and increase in high-frequency variants. (B) Newly proposed model involving introgression into the modern human ancestor from an unknown hominin that separated from the human ancestor before the split of modern humans and the ancestors of Neanderthals and Denisovans. Below, we show the CSFS fit from the proposed model, which captures the U-shape observed in the data. Credit: *Science Advances* (2020). DOI: 10.1126/sciadv.aax5097

A team of researchers at the University of California, has found evidence of "ghost" DNA in some modern West African people. In their paper published in the journal *Science Advances*, the group describes their study of genetic samples collected from the Yoruba and Mende groups and what they found.

Prior research has shown that approximately 800,000 years ago, two groups of hominins diverged from a common ancestor—they have become known as the Denisovans and Neanderthals. In this new effort, the researchers have found evidence that suggests a prior group split off from the same common ancestor 200,000 years earlier.

The researchers were studying the lineages of the Yorùbá of southwestern Nigeria and the Mende people of Sierra Leone. The researchers found some non-modern human DNA in samples. That led

them to compare the non-human segments to Denisovan and Neanderthal DNA. When they found no match, the researchers were forced to conclude that the DNA was from a common ancestor that diverged over 1 million years ago. Since no fossils of this other ancestor have ever been found, the researchers dubbed their genetic remnants "ghost" DNA. Further study of the gene snippets showed that they were introduced into the modern human genome approximately 24,000 years ago.

The researchers also found that the percentage of the ghost DNA in the Yorùbá and Mende people ranged from two to 19 percent. And those genes were of a type that would have been involved in suppressing tumors and regulating hormones. Due to the percentages found in modern humans, it appears likely that they spread quickly, which indicates widespread interbreeding with West African people for a short time. The team also found evidence of the same DNA in a few people of Han Chinese descent living in Beijing and some westerners living in the U.S., but those cases have not yet been studied more closely.

The researchers plan to continue to their study of the ghost genes, hoping to learn more about their role in the genome and why they persisted so well in West African people for such a long period of time.

More information: Arun Durvasula et al. Recovering signals of ghost archaic introgression in African populations, *Science Advances* (2020). DOI: 10.1126/sciadv.aax5097