

Error found in study of first ancient African genome

Finding that much of Africa has Eurasian ancestry was mistaken.

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An error has forced researchers to go back on their claim that [humans across the whole of Africa carry DNA inherited from Eurasian immigrants](#).

This week the authors [issued a note explaining the mistake](#) in their October 2015 *Science* paper on the genome of a 4,500-year-old man from Ethiopia¹ — the first complete ancient human genome from Africa. The man was named after Mota Cave, where his remains were found.

Although the first humans left Africa some 100,000 years ago, a study published in 2013 found that [some came back again around 3,000 years ago](#); this reverse migration has left its trace in African genomes.

In the *Science* paper, researchers confirmed this finding. The paper also suggested that populations across the continent still harbour significant ancestry from the Middle Eastern farmers who were behind the back-migration. Populations in East Africa, including Ethiopian highlanders who live near Mota Cave, carried the highest levels of Eurasian ancestry. But the team also found vestiges of the 'backflow' migration in West Africans and in a pygmy group in Central Africa, the Mbuti.

Andrea Manica, a population geneticist at the University of Cambridge, UK, who co-led the study, says the team made a mistake in its conclusion that the backflow reached western and central Africa. "The movement 3,000 years ago, or thereabouts, was limited to eastern Africa," he says.

Incompatible software

Manica says that the error occurred when his team compared genetic variants in the ancient Ethiopian man with those in the reference human genome. Incompatibility between the two software packages used caused some variants that the Ethiopian man shared with Europeans (whose DNA forms a large chunk of the human reference sequence) to be removed from the analysis. This made Mota man seem less closely related to modern European populations than he actually was — and in turn made contemporary African populations appear more closely related to Europeans. The researchers did have a script that they could have run to harmonize the two software packages, says Manica, but someone forgot to run it.

Pontus Skoglund, a population geneticist at Harvard Medical School in Boston, Massachusetts, says that he was surprised by the claim that as much as 6–7% of the ancestry of West and Central African groups came from the Eurasian migrants. But after obtaining the Mota man's genome from Manica's team, he and his colleague David Reich carried out their own comparison and found no evidence for that conclusion. They informed Manica's team, who then discovered the processing error.

"Almost all of us agree there was some back-to-Africa gene flow, and it was a pretty big migration into East Africa," says Skoglund. "But it did not reach West and Central Africa, at least not in a detectable way." The error also undermines the paper's original conclusion that many Africans carry Neanderthal DNA (inherited from Eurasians whose ancestors had interbred with the group).

Skoglund praised the paper — "the genome itself is just fantastic," he says — and the researchers' willingness to share their data and issue a speedy note about the error: they [posted it online on 25 January](#). When asked to confirm whether and when it would publish the researchers' update, a representative for *Science* said the journal couldn't yet comment.

Manica is not yet sure if *Science* will change the title of the paper, 'Ancient Ethiopian genome reveals extensive Eurasian admixture throughout the African continent'. But if the team had caught the error earlier, he says, "I'm sure we would have phrased things



Kathryn and John Arthur

This rocky area in Mota cave held bones that yielded the first ancient African genome.

differently”.

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References

1. Gallego Llorente, M. *et al.* *Science* <http://dx.doi.org/10.1126/science.aad2879> (2015).