

Ancient DNA evidence traces origin of horses' smooth ride

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This photograph shows an ambling Iceland pony during World Championship.
Credit: Monika Reissmann

Horses have held an important place in human history since ancient

times. So-called ambling horses are particularly prized for their ability to travel in a way that's comfortable for riders, with a smooth, four-beat rhythm. Earlier studies traced that easy gait to a single typo in a gene involved in coordinated limb movement. Now, researchers who have genetically examined historic horse remains say that gaitedness in horses made its first appearance in Medieval England around 850 AD and rapidly spread from there.

The findings are reported in the Cell Press journal *Current Biology* on August 8.

"We detected the origin of ambling [horses](#) in medieval England," says Arne Ludwig of the Leibniz Institute for Zoo and Wildlife Research in Berlin, Germany. "Vikings took these horses and brought them to Iceland and bred them there. Later, ambling horses were distributed from England or Iceland all around the world."

Ancient DNA offers a window into the past. In the new study, the researchers assembled DNA samples, including 90 horses going back to pre-domestic times, before 3500 BC, through to the Middle Ages. They examined the DNA in search of that earlier identified "gait keeper" variant in a gene known as DMRT3.

The researchers detected the tell-tale genetic change in two English horses from 850 to 900 AD and in ten out of 13 individuals from Iceland dating to the ninth to eleventh century. The gait keeper variant was absent in all of the horse remains from mainland Europe.

Ludwig and colleagues say that the discovery that ambling horses were present in Iceland so long ago strongly suggests that Norse people from Denmark and South Sweden took them from the British Isles to Iceland.

"Considering the high frequency of the ambling allele in early Icelandic

horses, we believe that Norse settlers selected for this comfortable mode of horse riding soon after arrival," the researchers write. "The absence of the allele in samples from continental Europe (including Scandinavia) at this time implies that ambling horses may have spread from Iceland and maybe also the British Isles across the continent at a later date."

Ludwig says that they were a bit surprised that the gait keeper variant didn't arise sooner, mainly because the trait now occurs so widely in horses all around the world. But, he notes, with strong selection in the course of breeding domesticated animals, "everything can happen very fast."

There are still many open questions about how human preferences changed over time and how those shifts influenced horses. The researchers say they are also interested in how those past events continue to influence [domesticated animals](#) and animal breeding today.

More information: Current Biology, Wutke et al.: "The origin of ambling horses" [www.cell.com/current-biology/f...](http://www.cell.com/current-biology/fulltext/S0960-9822(16)30752-7)
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