

Out of America: ancient DNA evidence for a new world origin of late quaternary woolly mammoths.

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Report

Out of America: Ancient DNA Evidence for a New World Origin of Late Quaternary Woolly Mammoths

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Summary

Although the iconic mammoth of the Late Pleistocene, the woolly mammoth (*Mammuthus primigenius*), has traditionally been regarded as the end point of a single anagenetically evolving lineage, recent paleontological and molecular studies have shown that successive allopatric speciation events must have occurred within Pleistocene *Mammuthus* in Asia, with subsequent expansion and hybridization between nominal taxa 1, 2. However, the role of North American mammoth populations in these events has not been adequately explored from an ancient-DNA standpoint. To undertake this task, we analyzed mtDNA from a large data set consisting of mammoth samples from across Holarctica (n = 160) and representing most of radiocarbon time.

Our evidence shows that, during the terminal Pleistocene, haplotypes originating in and characteristic of New World populations replaced or succeeded those endemic to Asia and western Beringia. Also, during the Last Glacial Maximum, mammoth populations do not appear to have suffered an overall decline in diversity, despite differing responses on either side of the Bering land bridge. In summary, the “Out-of-America” hypothesis holds that the dispersal of North American woolly mammoths into other parts of Holarctica created major phylogeographic structuring within *Mammuthus primigenius* populations, shaping the last phase of their evolutionary history before their demise.



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