

Genetic history and culture of the oldest population of North Asia

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The oldest inhabitants of Northern Asia were most likely the late *Homo erectus*, who reached the foothill and low–mountain regions of Altai about 800 thousand years ago, where the most ancient Paleolithic objects were found – Karama and Ulalinka. Erectus came to the territory of Altai with the first migration wave from Africa, moving in a north-easterly direction through the Middle East, the Western Asian Highlands and the western regions of Central Asia. Penetration of erectus up to 52° north. It testifies to their significantly increased cognitive abilities, the development of effective adaptation strategies that allowed them to develop new areas in the northern part of Eurasia. The culture-bearing deposits of Karama indicate that representatives of the first migration wave with archaic pebble tools lived in Altai for almost the entire first half of the Middle Pleistocene. About 600 thousand years ago due to the significant cooling, early hominins apparently left this territory, migrating to regions with a more favorable climate, or died out, unable to adapt to the changed natural conditions.

The next stage of settlement of Northern Asia began about 300 thousand years ago with the appearance of the Denisovan in Altai, a carrier of Middle Paleolithic cultural traditions. The Denisovans brought to the newly developed territories more advanced methods of producing stone tools on deliberately shaped chips removed from well-prepared nuclei, i.e. techniques of parallel and Levallois splitting, as well as techniques of two-sided stone processing.

The formation of Denisovans, as well as Neanderthals, apparently occurred on the ancestral basis of the late *H. heidelbergensis* in the chronological interval of 400–200 thousand years ago. Sequencing of the nuclear genome of Denisovan showed that the separation of Denisovans and Neanderthals populations took place 430–380 thousand years ago [1]. The late *H. heidelbergensis*, settling from the Levant in the Iranian Highlands and further into Central and Northern Asia, gave rise to a new taxon – the Denisovan, the remains of which were first discovered in the Denisova Cave. The industry of Denisovans in the lower cultural layers of the Denisova Cave is technically and typologically close to the Ashelo-Yabrudien materials of the Levant.

Anthropological and paleogenetic data indicate that Denisovans lived in the cave for a long time, which is consistent with cultural continuity in the development of stone industries and suggests that Denisovans were an autochthonous population, with which the development of Middle Paleolithic and early Upper Paleolithic cultural traditions is associated. At the same time, remains of Altai Neanderthals were found in the Middle Paleolithic layers of Denisova Cave, but no vivid manifestations of Mousterian traditions were revealed, which is probably explained by the interbreeding of Denisovans and Neanderthals. Evidence in favor of this assumption is the bone of a hybrid girl found here, whose mother was a Neanderthal and her father was a Denisovan.

From the early stage of the Middle Paleolithic, the Denisovans developed an original stone industry with the periodic participation of Altai Neanderthals, which served as the basis for the formation of the Upper Paleolithic culture on an autochthonous basis in the interval of 50–40 thousand years ago with sets of stone and bone tools, as well as objects of symbolic activity, indicating a sufficiently high level of material and spiritual culture of the inhabitants of Altai at the beginning of the Upper Paleolithic. At the same time, the methods and techniques of Denisovans life activity were not inferior to the behavioral characteristics of early *H. sapiens* that appeared in the west of Siberia no later than 45 thousand years ago [2]. Denisovans, like Neanderthals, participated in the formation of a modern human species, transferring about 6 % of their genome to modern inhabitants of Australia, Oceania and the island part of Southeast Asia [3].

Although the remains of Denisovans have so far been found only in two caves (Denisova in the Altai and Baishiya Cave on the Tibetan Plateau), the level of their genetic diversity was higher than that of seven Neanderthals from different regions of Western and Central Europe, for whom complete mtDNA sequences were obtained, but lower than that of modern humans [4]. These data indicate that the population of Denisovans could be larger in number and more diverse than the population of Neanderthals, and also that Denisovans apparently had an exceptionally wide geographical distribution from Northern to tropical Asia [5].

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References

1. Meyer et al. *Nature*. 2014;505.
2. Fu et al. *Nature*. 2014;514.
3. Reich et al. *Am J Hum Genet*. 2011;89(4).
4. Sawyer et al. *PNAS*. 2015;112(51).
5. Prüfer et al. *Nature*. 2014;505.