

Populations of woolly mammoth in North-East Siberia – dwarfing in isolation or last stage of extinction?

A. Tikhonov¹, S. Vartanyan²

¹*Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia*
tkh@at8162.spb.edu

²*Wrangel Island State Reserve, Ushakovskoe, Russia*

At the end of the Pleistocene the range of woolly mammoth in Eurasia became dissected into isolated populations. Some of these were in Europe but the largest, as probably the case for other Pleistocene ungulates, existed in the north of Siberia. On Wrangel Island and the Taimyr peninsula, they crossed the boundary into the Holocene, surviving into the Holocene global warming.

The description of a “dwarf” race of mammoth from Wrangel Island raised questions about the reasons for dwarfing in this population. At the same time some mammoth remains from the latest Pleistocene (Berelekh, Sevsk and others) are of much smaller size than is usual for the Late Pleistocene woolly mammoth.

Our study of postcranial bones and recent finds of Holocene teeth on Wrangel, of normal size, show that the Holocene population of mammoth on the island included animals whose size is comparable to other mammoths from the Pleistocene-Holocene boundary in Eurasia. Nevertheless a representative set of molars, as well as tusks and some limb bones from Wrangel, are of “dwarf” size. So it is appears that animals of normal size coexisted on the island with others of almost dwarf size, and moreover that the latter are predominant by quantity of finds. Wrangel Island was fully isolated from 8000 years BP, and the mammoth population survived on this small (for this species) island for at least 4500 years. During this period the process of dwarfing started, but

rapid changes of climate, and decreasing food, prevented the animals from becoming real dwarfs.

On the mainland, the latest isolated populations had more space so this provided no reason for dwarfing there. However, in the collections of mammoth bones from localities in North-East Siberia (Yana-Indigirka Lowland and the region to the east of the Kolyma River), some bones and teeth are of comparable size to the Wrangel “dwarfs”. These specimens form up to 7-8 % of the collections as a whole.

“Dwarfs” are also famous from more ancient deposits throughout Eurasia. The explanation of this phenomenon may be aided by comparison with the individual variability of elephants. Among recent elephants in Africa and Asia, smaller-sized individuals or populations can be found, and in one case these have been described as a separate species or subspecies (the forest elephants west and central Africa). Woolly mammoths on the mainland of Siberia became extinct without dwarfing, but in the last populations the size of the animals was much smaller than in previous times.

Finally we can say that only one refugium of woolly mammoth in the North-East of Siberia - Wrangel Island - had a population with signs of dwarfing. All other regions, including those adjacent to island territories, had a population of animals of normal size which, however, became generally smaller during the last stage of extinction.