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ABSTRACT BOOK

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Overview and preliminary analysis of the new finds of Late Pleistocene mammoth fauna in the Yana-Indigirka Lowland, Yakutia, Russia

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Our analyses incorporate three localities with numerous (Selliach, MusKhaya, Bulguniakch lakes) and two with single (Chondon and Buor Yuriakh) woolly mammoths remains in the Yano-Indigirka lowland.

The first site (70°45'N, 140°45'E) is located on the right bank of the Selliach River, 57 km upstream to the east from a settlement "Tumat" (Fig. 1). The discovered bones come from a single horizon at 5-6 m depth. The bone concentration occupied approximately 10-12 square meters area. About 99% of all fossil remains belong to *Mammuthus primigenius* (Blumenbach, 1799). The amount of the right and left limb bones, tusks, as well as fragments of skulls corresponds to about 20 mammoth individuals. The group consisted mainly of mature animals of 20/30 to 45 years old (62%), supplemented by young individuals from 1/6 to 13/16 years old (38%) (Fig. 2A). Probably, the small group of mammoths died by accident (flood, trapped in bog).

The Mus-Khaya site is located 30 km downstream from the settlement "North", 70°43' N 135°24'E (Fig. 1). The site rests on the bank at a 30-40 m height above the water surface, and represents 1300-1400m long ice core outcrops, which are constantly thawing. Studies of numerous bone remains of *M. primigenius* revealed the following mammoth age groups: from 1/2 to 13 years old - 55%, from 13/35 to 50/60 years old - 41%, and 50/60 years old- 4% (Fig. 2B). In total, remains of 13 mammoths (with at least one male and three females) were aged between 2 to 70 years old individuals.

The Bulguniakh lake (70°45'N, 138°17'E; Fig. 1) is a thermokarst lake formed as a result of a thawing 40-meters deep ice composing its bottom and banks. The Bulguniakh fauna included the following taxa, typical for the Late Pleistocene mammoth fauna of northeastern Eurasia: Proboscidea (*M. primigenius*), Perissodactyla (*Equus lenensis*, *Coelodonta antiquitatis*), Artiodactyla (*Bison* sp., *Ovibos* sp., *Rangifer tarandus*) and carnivorous mammals. The largest number of bones found at the site belongs to the woolly mammoth. Among those, remains of mature and old individuals (males and females), as well as young mammoths (3 calves from 1 to 3- 4 years old) are identified. Total number of mammoths suggests 10 individuals at least: three of them are represented by sexually matured males (two old and one young, with unfused epiphyses on long bones), four sexually matured females (three females with fused long bone's epiphyses and one female with unfused epiphyses), 3 calves (1 about a year old and two calves from 2 to 3/4 years old) (Fig. 2C).

According to E.N. Mashchenko (2002), the structure of mammoth and modern elephant herds are similar. The groups were mainly formed by females and their calves. Under adverse conditions or some common threats, groups could form a "clan" containing up to 70 individuals headed by a senior female. Males that reached sexual

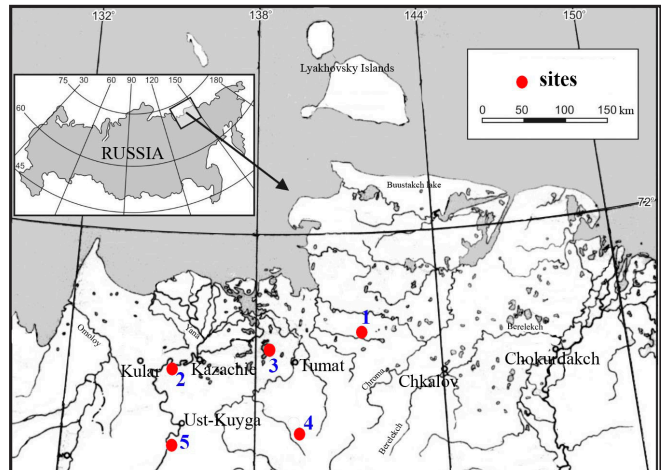


Fig. 1. The studied sites in the Yana-Indigirka lowland: 1, Selliach River; 2, Mus-Khaya; 3, Lake Bulguniakhtakh; 4, Chondon River; 5, Buor-Uriakh River.

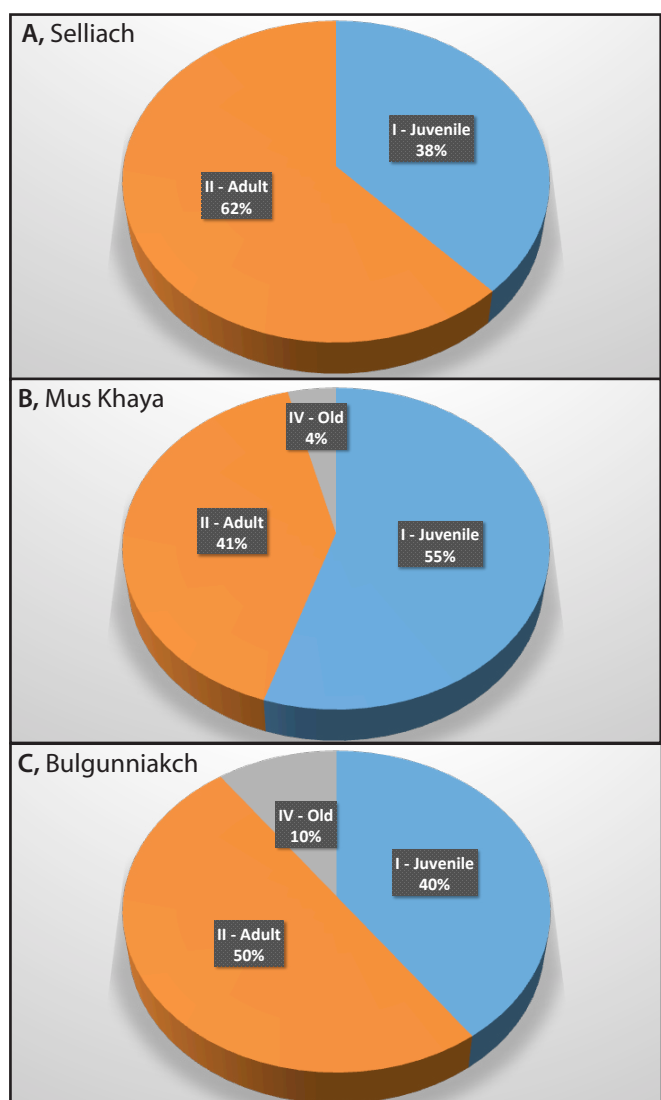


Fig. 2. The percentage of age groups in the studied sites.

maturity would leave, being expelled from the herd and form a small group of young males. Forming groups was one of their ways of adapting to environment. Collective behavior includes the joint care of the offspring and protection from predators. By analogy to modern elephants, mammoth groups might have formed a large herd, which is confirmed by findings of individuals of different ages together in many localities. Groups were formed to protect the youngs, as well as for long-term migrations, which determined their survival.

The site (70° 17'N, 138° 00'E) of the Chondonskiy mammoth (*M. primigenius*) is located on the bank of the right unnamed tributary of the Chondon River, at the foot of the Poluosniy Ridge, in the region of "Ygyannya", 66 km south-west from the settlement Tumat, Ust-Yana Ulus (Fig. 1). The site occupies the approximately 250-300 m long and 20-30 m high outcrop exposure formed as a result of thawing sediments of the right bank of the river. The remains discovered at the site belonged to a single woolly mammoth, *M. primigenius*, about 47-50 years old with estimated withers height 290-300 cm.

The site (69°33'N; 134°43' E) on the Buor-Yuriakh River is located 66 km southwest from the settlement Ust-Kuiga, Ust-Yana Ulus, Osokhtokh Region (Fig. 1). The area is a typical taiga with numerous bogs and lakes. The discovered bones of *M. primigenius* comprise 15% of the skeleton. The dense localization of bone elements and proportions of limb bones (scapula, ulna, femura and tibia) indicate that the bones belong to a single individual. Based on the compact tissue morphology in diaphyses of long bones and vertebrae, and complete obliteration of the epiphyseal fusions on long bones, vertebral centrums, as well as the presence of the last (sixth) molar (M3), the age of the

individual was over 50 years old. The estimated height of the Buor-Yuryakh mammoth at withers, calculated from long limb bones, is about 318 cm.

Apparently, the mammoth fauna lived in open and semi-open landscapes (arctic steppe, shrubs) in Yana-Indigirka lowland during the Late Pleistocene. In this period, several major changes occurred in the landscape and climatic conditions (the phase of late postglacial warming from about 12,800 to 12,300 years ago) (Nikolskiy et al., 2010). During this period, specific disastrous conditions were formed for the largest representatives of the mammoth fauna - woolly mammoths, in the Yana-Indigirka lowland. This happened due to the specifics of the relief (prevalence of the lowland habitats) and the presence of major river basins (Omoloy, Yana, Indigirka Rivers). Seasonal river floods could have destroyed not only the individuals, but entire herds of mammoths.

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