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FINDS OF MAMMALIAN REMAINS OF THE MAMMOTH FAUNA WITHIN THE TERRITORY OF THE "LENA PILLARS" NATURAL PARK

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In the middle reaches of the Lena River, within the "Lena Pillars" National Park and its adjacent territories, very interesting fossil remains were found. In the Buotama River mouth, bones of mammoth *Mammuthus primigenius* Blum., woolly rhinoceros *Coelodonta antiquitatis* Blum., Lena horse *Equus lenensis* Russ., Pleistocene bison *Bison priscus* Boj., bighorn sheep *Ovis nivicola* Esch., elk *Alces* sp., reindeer *Rangifer tarandus* L. were found (Boeskorov et al., 1988). In the Quaternary deposits of the Diring-Yuryakh outcrop, remains of *Equus lenensis*, *Bison priscus* Boj., and *Alces* sp. were found (Alexeev et al., 1990; Kamaletdinov, Minyuk, 1991). Near the very boundary of the Park, on the Uhlakhan-Ary Island situated opposite the Kachikatsy settlement, remains of mammoth, Lena horse, bison, bighorn sheep, reindeer and red deer *Cervus elaphus* L. were found.

Since 1995 up to 2006, the schoolchildren of the Oi Secondary school (Khangalassky region, Nemyugyuntsy settlement) have made a considerable collection of fossil remains under the direction of Prof. N.G. Solomonov and the school deputy-director P.R. Nogovitsyn. During this period, summer ecological tours yielded mammoth fauna find sites in the Buotama River mouth, and on banks of the Labyya and Kouranakh streams. Hundreds of bone remains of mammoth fauna mammals collected there were deposited at the Oi school's museum and at the Mammoth Museum. Those recordings proved that mammoth, woolly rhino, Lena horse, bison, bighorn sheep, reindeer, red deer, and elk inhabited the modern territory of the Park. In 1996, in the "Kuokh Khaya" Site (Buotama River bank) tens of mammoth bones were found thawed out of bank deposits from the 4-meter depth (Boeskorov et al., 1988). In 2003, a metatarsus of fossil red deer was found in the Buotama River mouth.

Radiocarbon and palynological analyses were applied for investigation of the mam-

moth fauna find sites within the National Park's territory. Three radiocarbon data were achieved from the bone remains of fossil red deer. Absolute age of an antler from the Kouranakh stream was estimated as 17400 ± 200 BP belonging to the period of Sartanian glaciation. An antler fragment of *Cervus elaphus* from the Uhlakhan Arvy Island is over 37600 cyrbp, and another antler fragment of the same species is over 37900 cyrbp; most likely, they belong to the Karginian interstadial when arboreal and shrubby vegetation was spread toward the North (Boeskorov, 2005).

Bone-bearing sediments from the Buotama River (Kuokh Khaya) and Kouranakh stream were studied in 1996 by palynologist A.I. Tomskaya. Palynological analysis of sediments from Kuokh Khaya (black clay with inclusion of yellow loam at the depth of 4 m, mammoth skeleton burial place) resulted in spore-pollen spectrum with predominance of trees and shrubs pollen (55.5%). Shrub species included *Betula exilis* Sukaczew (12.1%), *B. divaricata* Ledeb. (11%), and *Pinus pumila* (Pall.) Regel (5%). Arboreal plants were represented by pine-tree (9.4%), larch (6%), fir-tree (3.4%), white birch (7.7%), and poplar. Spore group (30.8%) comes second with prevailing of green mosses (15.2%). Also (in descending order of amount) spores of the following plants are present: Filices, grape-fern, northern club-moss, horsetail, Issler's club-moss. Few in number herb group (13.7%) is mostly represented by Cyperaceae (10.3%), and also includes pollen of plantain and wormwood.

All abovementioned plants grow in Central Yakutia at present times: mountain pine and Middendorff's birch inhabit montane landscapes under rock belt, larch is the main forest species, while white Asian white birch, fir- and pine-tree represent admixture of larch forests. Pine forest grows on small watersheds and sandy slopes. Green mosses, horsetails, most sedges, and *Betula exilis* prefer moist habitations - river banks, lake sides, swamps, meadow bogs. Many fern species and northern club-moss grow on rocks, detritus of mountain slopes.

Quantitative and taxonomical composition of the spore-pollen spectrum described by A.I. Tomskaya evidences presence of pine-larch forests with admixture of birch during that period of time, as well as lakes and swamps in floodplains. Pollen and spores of inhabitants of mountainous landscapes were probably brought by river streams and winds. The studied sediments date from the second interstadial (Karginian) of the Late Pleistocene.

A sample of the loose Quaternary sediments was studied removed from the outcrop situated 3 km above the confluence of the Kouranakh stream and the Lena River. There remains of mammoth, woolly rhinoceros, Lena horse and bison were found. These sediments represent low-carbonate loam of reddish hue. The sample was removed from the bone-bearing stratum at 1-meter depth. The spore-pollen spectrum is characterized by prevailing of spores (41.5%) of green mosses (14.3%), ferns (11.7%), northern club-moss (9%), liverworts (5.2%), and horsetail. Herb pollen (35.1%) is predominated by Cyperaceae (20.8%) and Asteraceae (7.8%), also Poaceae, Liliaceae, and *Artemisia jacutica* Drobow pollen is present. Pollen of trees and shrubs (23.4%) represents even a lesser part. Considerable content of green mosses spores, pollen of Cyperaceae and Liliaceae evidences, in A.I. Tomskaya's opinion, accumulation of the loam under humid and chilly climatic conditions of the Karginian period. Thus, mass burials of fossil remains within the territory of the National Park might take place during the Karginian interglacial (26-55 Ka BP). At that time, numerous thermokarst "traps", mires, wetlands formed during summer, and mammoths, woolly rhinos and other large mammals got stuck in and died (Vereshchagin, 1979).

Analysis of available fossil records allows characterize species composition of large mammals inhabiting the modern territory of the National Park during the Late Pleistocene. Remains of 9 mammoth fauna species were discovered there. The oddly fact is that only brown bear was found among predators. Whereas the territory of Central Yakutia was inhabited by wolves, arctic foxes, foxes, wolverines, cave lions (Boeskorov, 2005). We assume that further excavations ought to yield remains of abovementioned predators both in the Lena Pillars region. Mammoth being widely distributed species of the Late Pleistocene in Yakutia apparently was common in the Parks territory as well. Remains of this woolly elephant were found at most find sites. Bone remains of Lena horse and bison (common species of Yakutian mammoth fauna) are also abundant. Several bones of woolly rhinoceros were found near the Kouranakh stream. Remains of deer were also discovered in the Park. Antler remains and metapodia of red deer evidence larger size of the Late Pleistocene Siberian red deer comparing to their modern

forms. Isolated moose remains indicate that this species being forest inhabitant wasn't abundant during mammoth fauna existence. On the contrary, reindeer was common species accompanying mammoths. Bighorn sheep remains are quite interesting finds of the Lena Pillars and adjacent territories. Until recently, only two such finds have been recorded: in the Ulakhan Ary Island and in the Buotama River mouth (Alexeev et al., 1990; Boeskorov, 2001). In summer 2006 on the Kouranakh stream bank, schoolchildren found a skull fragment of fossil bighorn sheep with corneous cores. At present, *O. nivicola* is a typical mountainous species (Revin et al., 1988; Krivoshapkin, Yakovlev, 1999). Fossil remains of bighorn sheep found on riversides of the Central Yakutian Plateau and Lena Plateau characterized by elevation of 200-300 m a.s.l. (now and during the Pleistocene) evidence that this animal might inhabit small-hilled landscapes or even plains (Boeskorov et al., 2001). Size features investigation showed that the bighorn sheep specimen from the Kouranakh stream was rarely large individual. Neither fossil remains nor modern specimens of *O. nivicola* have been recorded of such big size (Boeskorov et al., 2001).

By present, remains of the Pleistocene musk-ox *Ovibos pallantis* and Siberian saiga *Saiga tatarica borealis* (indicator species of mammoth fauna for considerable part of Yakutia) haven't been recorded yet in the Lena River's middle reaches including the Park's territory. It would seem that these species might find suitable habitats in flat landscapes of Central Yakutia. Though this region is characterized by rare finds of these animals' remains. Population number of musk-ox and saiga was probably undermined by a man of the Upper Palaeolith which is evidenced by its numerous sites found there (Boeskorov, 2005).

The mammoth fauna find sites within the "Lena Pillars" National Park's territory are promising for palaeontological, stratigraphic, and palaeoecological investigations. In future, these natural monuments may play significant role in tourism development as well.