

# The frozen mummy of the woolly rhinoceros, *Coelodonta antiquitatis* Blum., 1799 calf: a new data on early ontogenesis of the extinct species



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**Introduction**

The extinct woolly rhino (*Coelodonta antiquitatis* Blum., 1799) is the second largest species of the megafauna that inhabited a wide territory of Eurasia that stretched from the European to the eastern Kirgiz of Siberia and from British and High Arctic islands to southern Europe, southern Siberia and northeastern China during the second half of the Pleistocene (Durban, 1999; Boeskorov, 2001; Galardi & Boeskorov, 2005). However, unlike woolly mammoths, findings of the frozen carcasses of the woolly rhinos are very rare. They have been discovered and described by scientists in the 1950s and 1960s. Among them are two heavily decomposed frozen woolly rhinos (Boeskorov and Klimovskii, 1963) and one well-preserved frozen woolly rhino (Boeskorov and Klimovskii, 1963). In addition, there are several well-preserved bones, including the "Younger Rhino" (Boeskorov and Klimovskii, 1963) and the "Berkovskii Rhinoceros" (Boeskorov and Klimovskii, 1963). The discovery of the "Berkovskii Rhinoceros" (Boeskorov and Klimovskii, 1963) is a well-preserved frozen woolly rhino that was found in the 1950s. It was the first frozen woolly rhino discovered in the world. The discovery of the "Berkovskii Rhinoceros" (Boeskorov and Klimovskii, 1963) is a well-preserved frozen woolly rhino that was found in the 1950s. It was the first frozen woolly rhino discovered in the world.

The study of the frozen mummy of the woolly rhino is important for understanding the early ontogenesis of the extinct species. It provides information on the morphology and structure of the skeleton, the development of the body, and the conditions of the environment in the last Pleistocene. The study of the frozen mummy of the woolly rhino is important for understanding the early ontogenesis of the extinct species.

**Location, description and discovery**

The frozen mummy of the woolly rhino was discovered in the 1950s in the Berek site, located in the central part of the Taiga zone of the Khatanga Basin. The discovery was made by the expedition of the Yakutian Academy of Sciences, led by V.I. Boeskorov. The mummy was found in a peat bog, which was partially covered by a layer of peat. The mummy was discovered on July 10, 1957, during the summer season. It was found in a peat bog, which was partially covered by a layer of peat.



Fig. 1. The location of the Berek site.

Coordinates	Distance km
68°20' N, 125°00' E	100
68°30' N, 125°00' E	120
68°40' N, 125°00' E	140
68°50' N, 125°00' E	160
69°00' N, 125°00' E	180
69°10' N, 125°00' E	200
69°20' N, 125°00' E	220
69°30' N, 125°00' E	240
69°40' N, 125°00' E	260
69°50' N, 125°00' E	280
70°00' N, 125°00' E	300
70°10' N, 125°00' E	320
70°20' N, 125°00' E	340
70°30' N, 125°00' E	360
70°40' N, 125°00' E	380
70°50' N, 125°00' E	400
71°00' N, 125°00' E	420
71°10' N, 125°00' E	440
71°20' N, 125°00' E	460
71°30' N, 125°00' E	480
71°40' N, 125°00' E	500
71°50' N, 125°00' E	520
72°00' N, 125°00' E	540
72°10' N, 125°00' E	560
72°20' N, 125°00' E	580
72°30' N, 125°00' E	600
72°40' N, 125°00' E	620
72°50' N, 125°00' E	640
73°00' N, 125°00' E	660
73°10' N, 125°00' E	680
73°20' N, 125°00' E	700
73°30' N, 125°00' E	720
73°40' N, 125°00' E	740
73°50' N, 125°00' E	760
74°00' N, 125°00' E	780
74°10' N, 125°00' E	800
74°20' N, 125°00' E	820
74°30' N, 125°00' E	840
74°40' N, 125°00' E	860
74°50' N, 125°00' E	880
75°00' N, 125°00' E	900
75°10' N, 125°00' E	920
75°20' N, 125°00' E	940
75°30' N, 125°00' E	960
75°40' N, 125°00' E	980
75°50' N, 125°00' E	1000
76°00' N, 125°00' E	1020
76°10' N, 125°00' E	1040
76°20' N, 125°00' E	1060
76°30' N, 125°00' E	1080
76°40' N, 125°00' E	1100
76°50' N, 125°00' E	1120
77°00' N, 125°00' E	1140
77°10' N, 125°00' E	1160
77°20' N, 125°00' E	1180
77°30' N, 125°00' E	1200
77°40' N, 125°00' E	1220
77°50' N, 125°00' E	1240
78°00' N, 125°00' E	1260
78°10' N, 125°00' E	1280
78°20' N, 125°00' E	1300
78°30' N, 125°00' E	1320
78°40' N, 125°00' E	1340
78°50' N, 125°00' E	1360
79°00' N, 125°00' E	1380
79°10' N, 125°00' E	1400
79°20' N, 125°00' E	1420
79°30' N, 125°00' E	1440
79°40' N, 125°00' E	1460
79°50' N, 125°00' E	1480
80°00' N, 125°00' E	1500



Fig. 2. The Berek Rhino before the study.

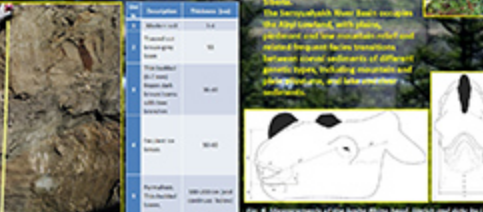


Fig. 3. Measurements of the Berek Rhino skull (left) and jaw (right).

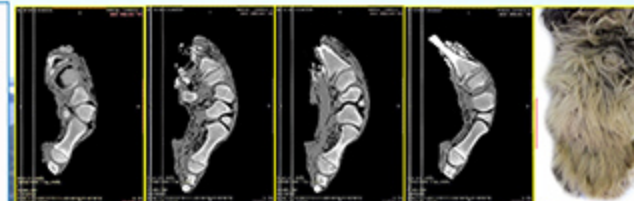
The Berek Rhino skull was located approximately 1.4 meters below the surface of the peat bog, and about 20-25 meters from the site. The skull was found in a peat bog, which was partially covered by a layer of peat. The skull was discovered on July 10, 1957, during the summer season. It was found in a peat bog, which was partially covered by a layer of peat.

**RESULTS**  
Detailed external morphology of the Berek Rhino body. The body of the Berek Rhino was located approximately 1.4 meters below the surface of the peat bog, and about 20-25 meters from the site. The body was found in a peat bog, which was partially covered by a layer of peat. The body was discovered on July 10, 1957, during the summer season. It was found in a peat bog, which was partially covered by a layer of peat.

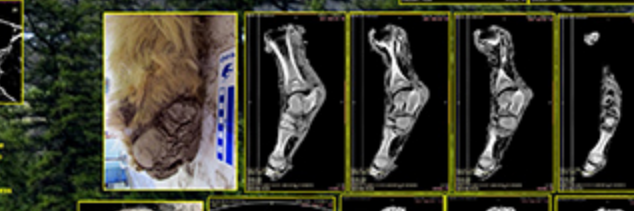
**Head**  
The head of the Berek Rhino was located approximately 1.4 meters below the surface of the peat bog, and about 20-25 meters from the site. The head was found in a peat bog, which was partially covered by a layer of peat. The head was discovered on July 10, 1957, during the summer season. It was found in a peat bog, which was partially covered by a layer of peat.

**Teeth**  
The teeth of the Berek Rhino were located approximately 1.4 meters below the surface of the peat bog, and about 20-25 meters from the site. The teeth were found in a peat bog, which was partially covered by a layer of peat. The teeth were discovered on July 10, 1957, during the summer season. It was found in a peat bog, which was partially covered by a layer of peat.

**Limbs**  
The limbs of the Berek Rhino were located approximately 1.4 meters below the surface of the peat bog, and about 20-25 meters from the site. The limbs were found in a peat bog, which was partially covered by a layer of peat. The limbs were discovered on July 10, 1957, during the summer season. It was found in a peat bog, which was partially covered by a layer of peat.



The tooth is represented by enamel and soft tissues covered by dentin. From distal parts of the crown to the base, there are 11 teeth, which are evenly attached to the head and neck, forming with the rest of the skull. It is 12.7 cm long and 2.2 cm wide. The tooth is covered by a layer of enamel, which is 1.2 cm thick. The enamel is covered by a layer of dentin, which is 1.5 cm thick. The tooth is covered by a layer of dentin, which is 1.5 cm thick.



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# **The frozen mummy of the woolly rhinoceros, *Coelodonta antiquitatis* Blum., 1799 calf: a new data on early ontogenesis of the extinct species**

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The new woolly rhino calf ‘Sasha’ was found thawed out from the bank deposits of the unnamed tributary of the Semyulyakh River in Abyi District of Yakutia (Sakha) Republic in September 2014. It represents the first find of a frozen mummy of the extinct species of such a young age.

The woolly rhino comprises about a half of the animal’s body, which is covered by light brown hair. The preserved specimen retained the head, with some missing skin on its back, the left ear, eye lids, the tightly attached nasal and frontal horns, the left fore and hind limbs, and a large piece of skin from the torso. The missing parts may still remain in the sediments of the Sasha locality.

The horns are very small in size: the nasal horn is relatively narrow from the base to the tip, has a rounded, smooth top and is taller than the frontal horn. The frontal horn has the appearance of a “tower”, with rounded edges on the dorsal surface worn to the flat plateau. This wear may have been the result of rubbing against its mothers belly since birth while nursing.

The CT scan of the head revealed few preserved internal organs, including the tongue, brain tissue, the complete right eye with supporting tissues, the completely intact and intricate nasal concha with un-ossified nasal septum, and internal morphology of the foramens and canals containing blood vessels and soft tissues (? nerves). The calf also possessed two sets of the maxillary and mandibular deciduous incisors and four deciduous premolars in each jaw quadrangle. Three crowns of unerupted permanent M1 in different developmental stages are in the alveoli. The deciduous premolars and M1 development and wear places the specimen in the early phase of the group IV (1-1.5 years) of the modern white rhinoceros (*Ceratotherium simum*) dental stages and in the early phase of the group C-I (1-1.5 years) of the woolly rhinoceros. At this age, Sasha would have still been nursing.

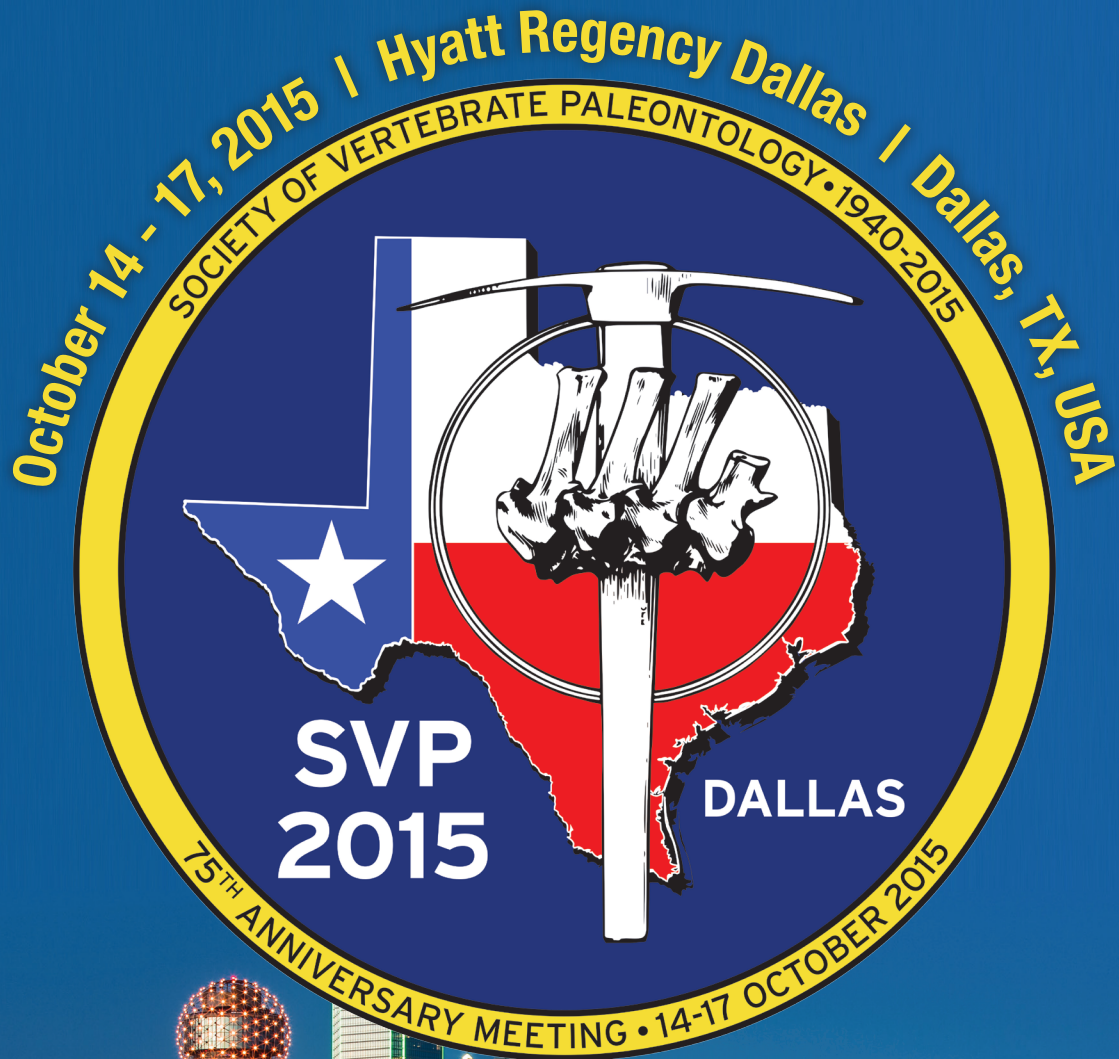
Sasha’s infantile age determination is supported by visible sutures between most of the skull bones, including the occipito-squamosal, basioccipital-basisphenoidal, basisphenoid-pterigoidal, premaxillae-maxillary and palatals. The fore limb epiphyses are not completely formed and not fused, but at least two terminal phalanges (hoofs) are ossified.

The definite cause of Sasha death is not yet detected. However, the presence of some sediment in both nasal airways over the upper deciduous DI1-Dp3, and sediment completely blocking the left nasal airway over the Dp2-Dp4 indicate the baby’s entrapment in the mud hole, and a possible cause of death by asphyxia from drowning.

## ***Citation:***

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