

## New finds of Late Pleistocene lions, *Panthera (Leo) spelaea* in Yakutia (North-Eastern Asia)

Gennady BOYESKOROV and Peter LAZAREV

Received: 21 July, 1994

Resubmitted: 16 Sep. 1996

Accepted for publication: 10 Feb. 1997

BOYESKOROV G., LAZAREV P. 1997. New finds of Late Pleistocene lions, *Panthera (Leo) spelaea* in Yakutia (North-Eastern Asia). Acta zool. cracov. **40**(2): 223-227.

Abstract. *P. spelaea* was one of the most widely distributed but not numerous predators in the Late Pleistocene tundra-steppes of Yakutia. Their bone remains are found in the valleys of practically all the big rivers of this region: Lena, Viluy, Aldan, Olenyok, Yana, Indigirka and Kolyma and also on Novosibirskie islands. Recently, 3 mandibles and a cranium of *P. spelaea* were found in the territory of Yakutia. Most remains of Yakutian lions belong to comparatively small form.

Key words: *Panthera spelaea*, Late Pleistocene, bone remains, Yakutia, N-E Asia.

Gennady BOYESKOROV, Peter LAZAREV, World Museum of Mammoth, Lenin avenue 39, 677891 Yakutsk, Yakutia, Russia.

### I. INTRODUCTION

Cave lions were widely distributed in the Northern Eurasia in the Late Pleistocene (KURTEN 1968; VERESHCHAGIN 1971; HEMMER, 1974; SOTNIKOVA 1989). At the beginning of the middle part of this period they migrated from North-Eastern Asia through the territory of Beringia to Alaska; thence they occupied North America and gave rise to the distinct large species *Panthera atrox* LEIDY, 1853 (HARRINGTON 1969; VERESHCHAGIN 1971; KURTEN & ANDERSON 1980).

The study of bone remains of Pleistocene lions from N-E Asia is important to the problem of affinities of the Eurasian and American lions.

*P. spelaea* was a widely distributed but not numerous predator in the Late Pleistocene tundra-steppes of Yakutia (East and North-East Siberia). Its bone remains were found in the valleys of practically all big rivers of this region: Lena, Viluy, Aldan, Olenyok, Yana, Indigirka and Kolyma and also on the Novosibirskie Ostrova (New Siberian Is. – Fig. 1) (VANGENGHEIM 1961; VERESHCHAGIN 1971; LAZAREV & TOMSKAYA 1987).

Recently, 3 mandibles and 1 complete cranium of *P. spelaea* were found in the territory of Yakutia. They will be analyzed in this paper.

A c k n o w l e d g m e n t s. The authors are very grateful to Dr. Marina V. SOTNIKOVA for reviewing the manuscript and providing many useful suggestions.

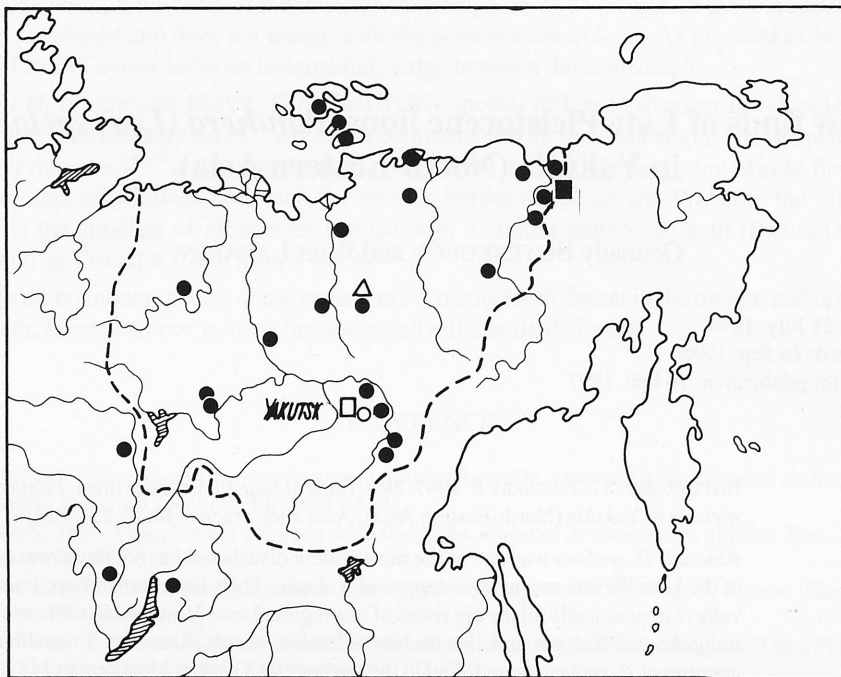


Fig. 1. Finds of Late Pleistocene lion remains in North-Eastern Asia: ● – previous finds, according to: VANGENGIM 1961; VERESHCHAGIN 1971; LAZAREV & TOMSKAYA 1987. New finds: Δ – Adycha River, Ulakhan-Sullar outcrop; ○ – Ityk-Kyuel village; □ – Lake Onyor; ■ – Kolyma River, Duvanny Yar outcrop. Broken line – Yakutia.

## II. MATERIAL, DESCRIPTION AND COMPARISON

Felidae FISCHER VON WALDHEIM, 1817

*Panthera spelaea* GOLDFUSS, 1810

**Material and locality.** N 15 (Fig. 2, Table I), fragment of left mandible; found at Ityk-Kyul village, Alexeevsky district at a depth of 3 metres in Upper Pleistocene deposits (Fig. 1) (Museum of Tatta village, Alexeevsky distr.).

N 27 (Fig. 3, Table I), right mandible; found in Upper Pleistocene deposits on the coast of Lake Onyor in the Ust-Aldan district (Fig. 1) (Museum of Borogonci village, Ust-Aldan distr.).

N 6880 (Table I), left mandible; found in the Ulakhan-Sullar outcrop, in the bank of the Adycha, Verkhoyansky district (Fig. 1) (Museum of Mammoth, Yakutsk); Late Pleistocene.

N 6397 (Table II), cranium; found in Yedomia formation deposits of the second half of the Late Pleistocene of the Kolyma River, Duvanny Yar (Fig. 1) (Geological Institute, Yakutsk).

**Description and comparison.** The mandibles N15 and N27 are comparatively small like those of other Late Pleistocene lions, found earlier in Yakutia (Table I). They are slightly mineralized. These mandibles have well developed chin protuberances; their lower margins have small prominences, typical of lions. Jaw N27 is relatively "massive", its height under P4 is comparatively large. Beside, N27 is characterized by a short diastema and symphysis; its anterior foramen mentale is larger than the posterior one; they are situated 11 mm apart.

Table I

Dimensions of mandibles of cave lions from Yakutia (mm)

Measurement	Adycha, Ulakhan-Sullar, WMM* N6880	Lake Onyor, Ust-Aldan distr., Borogonci Mus. N27	Ityk-Kyuel, Alexeevsky distr., Tatta vill. Mus. N15	B. Lyakhovsky Island, GIN*, (VANGENGIM, 1961) N367	Kolyma River, Beryozovka River, ZIN*, (VERE- SHCHAGIN, 1971) N29405
Length of:					
mandible	271.0	210.0	—	240.0	226.0
symphysis	78.0	62.0	64.5	81.4	78.0
diastema	25.5	20.0	24.2	26.0	27.0
C-M <sub>1</sub>	142.0	118.0	112.0	125.0	121.0
P <sub>3</sub> -M <sub>1</sub>	82.0	77.0	67.3	73.0	—
Length/Width:					
C	32.5/22.0	26.4/21.0	24.5/14.7	—	—
P <sub>3</sub>	19.0/11.0	19.0/8.6	16.4/8.8	21.2/—	—
P <sub>4</sub>	29.5/14.5	27.0/12.0	25.3/12.5	28.0/—	27.0/13.0
M <sub>1</sub>	30.5/15.0	27.0/14.0	27.2/13.2	29.0/—	30.0/14.0
Height of jaw:					
under P <sub>4</sub>	46.8	47.0	42.0	44.5	45.0
in proc. coronoideus	133.0	—	—	115.0	95.0

\* WMM – World Museum of Mammoth, Yakutsk; GIN – Geological Institute, Moscow; ZIN – Zoological Institute, Sankt-Petersburg.



Fig. 2. *Panthera spelaea* mandible from Ityk-Kyuel.

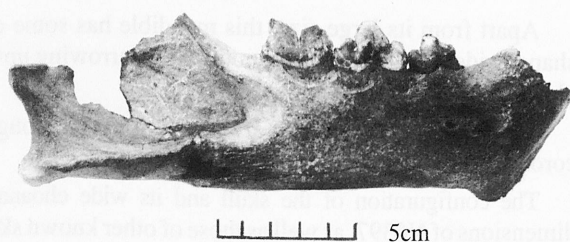


Fig. 3. *Panthera spelaea* mandible from Lake Onyor.

The main distinctive feature of N6880 is its large dimensions (Table I). It is considerably larger than other lower jaws of cave lions found in Yakutia. This mandible is mineralized and dark-brown in colour. N6880 has characteristic features of lions and cave lions: a distinct prominence on the lower margin under M<sub>1</sub>, relatively poorly developed angular process, wide aperture of the lower jaw canal, and the large size of M<sub>1</sub>.

Table II

Dimensions of crania of cave lions from Yakutia (mm)

Measurement	Kolyma River, Duvanny Yar, WMM, N6397	Kolyma River, Duvanny Yar, GI, (LAZAREV, TOMSKAYA 1987) N3190/1	Olenyok River, Mokhokho, ZIN, (VERESHCHAGIN 1971), N29398
Length:			
basal	275.0	275.2	263.0
condylo-basal	294.6	295.0	282.0
total	—	—	303.0
palatal	147.7	147.0	147.0
C-P <sup>4</sup>	102.0	102.7	103.0
nasal bones	—	—	70.0
Length/Width:			
P <sup>2</sup>	—	—	9.5/7.0
P <sup>3</sup>	24.2/10.3	—	24.0/14.0
P <sup>4</sup>	35.0/17.5	35.0/—	37.0/18.5
bullae tympani	51.0/28.0	45.6/29.4	41.0/25.0
Width:			
in canines	91.4	88.0	86.0
interorbital	64.5	67.6	58.0
zygomatic	212.0	213.8	198.0
Height: in processus			
postorbitales	124.5	—	102.0
occipital	111.4	—	91.0

Institution acronyms as in Table I.

Apart from its large size, this mandible has some original features: a comparatively narrow shape, wide coronoid process, noticeably narrowing upwards and wide foramina mentale situated close to each other (7 mm apart).

Skull N6397 (Duvanny Yar) seems to have belonged to an adult animal, because its sutura coronalis is obliterated.

The configuration of the skull and its wide choanal foramen are typical of *P. spelaea*. The dimensions of N6397, as well as those of other known skulls of Late Pleistocene lions from Yakutia (VERESHCHAGIN, 1971; LAZAREV & TOMSKAYA, 1987) are comparatively small (Table II).

### III. DISCUSSION

N. K. VERESHCHAGIN (1971) noted that West-European *P. spelaea* are, as a rule, larger than East-European and Siberian ones. However, the dimensions of the lower jaws and skulls of the Late Pleistocene lions from West Siberia, adduced in E. I. ALEXEEVA's (1980) work, were not inferior to the European ones.

A preliminary analysis shows that large lions inhabited Europe, Transcaucasia and West Siberia up to the end of the Late Pleistocene.

Dimensions of most bones of the cave lions from North-Eastern Asia are noticeably smaller than the former ones, although some of them obviously belong to adult males: N6397, N3190/1, N27 and N367.

Skulls N6397 and N3190/1 were found in Yedoma formation deposits (ice complex) of the second half of the Late Pleistocene. Mandibles N27 and N367 belong to that period too. So, we may suppose that a comparatively small form of cave lions inhabited North-Eastern Asia in the second half of the Late Pleistocene.

Mandible N6880 from the Adycha River is of particular interest. In its dimensions and form it is close to some jaws of large Late Pleistocene lions from Western Siberia (Krasny Yar) (ALEXEEVA 1980). Strong mineralization of this mandible would show that it is older than most other finds of Yakutian cave lions.

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