



The most interesting finds of Late Pleistocene megafauna, Vologda Region (Russia)



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ARTICLE INFO

Article history:

Available online 5 December 2013

ABSTRACT

The paleontological collections of museums of northern European Russia include unpredictable finds, such as the tooth of the forest elephant *Elephas (Palaeoloxodon) antiquus* (Falconer) in the collection of the Cherepovets Museum of Nature. The aim of the research is to define more precisely its systematic reference, age, and individual characteristics. The find indicates that the forest zone extended to 59–60°N during the Mikulin (Eemian) interglacial.

The paleontological collections of Vologda regional museums include exhibits referred to the Late Pleistocene, namely *Mammuthus primigenius*, *Equus sp.*, *Rangifer tarandus*, *Bison priscus*, and *Ovibos pal-lantis*. The majority of the finds conform to the transitional periods of warm and cold spells of the middle Valdai. Some Holocene finds of the region indicate the existence of favorable conditions for large-mammal species to inhabit the areas near 60°N.

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1. Introduction

The investigation of the Quaternary fauna is closely connected with problems of the Late Pleistocene glaciation reconstruction of northwest Russia. The work provides generalized information on the most important finds of the Late Quaternary fauna in the Vologda region. The material was inferred from collections of the regional museums and from local and academic publications. The available data resulted in compiling the map (Figs. 1 and 2).

Despite a great interest in the finds of “mammoth bones”, the region has not been reflected in the paleontological study of the European North (Fig. 2). Two skulls of musk-ox from the collection of the Cherepovets and Tot'ma museums have been mentioned (Gromova, 1935).

Smirnov (1937) was the first who systematically and in detail described the finds from the northern parts of the East European platform. He collected data on more than 200 finds of mammoth, bison, woolly rhinoceros and other animals' bones. Later, some finds were briefly commented on in geological surveys reports (Gey et al., 1977) and in some periodicals.

During the 1940s–1980s, Vereshchagin observed collections of Vologda Region museums. He was the first to notice the forest elephant's tooth (Shleichenko, oral report). The next researcher of Vologda regional collections was Garutt, who referred the forest elephant to *Elaphas (Palaeoloxodon) antiquus*.

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The other interesting find was mammoth bones (Yashina, 2000; Stuart et al., 2002) discovered to the north of Mologo-Sheksninskoye lake in 1943. Different laboratories provided radiocarbon determinations dated the age of those mammoth's bones from 9800 to 11,000 BP.

In total, 26 radiocarbon determinations of the bone age had been carried out for Vologda region museum material. Almost all the specimens can be referred to Middle Valdai (Middle Weichselian).

Since the late 1990s, the Cherepovets museum personnel had published information on collections in scientific periodicals (Yashina, 2002, 2003, 2005; 2006, 2007).

2. Regional setting and material

The Vologda region is situated in northwest Russia. The area represents the watershed system of the White, Baltic and Caspian seas, the final formation of which had taken place in the Late Pleistocene. Glaciations which left accumulations of morainial landforms can be considered as one of the main factors favoring this event. The position of this watershed system influenced landscapes, water systems, and ecological groups.

The present work was based on the materials resulting from fieldwork when the author became a member of the expeditions carried out by the Cherepovets Museum of Nature from 1997 to 2009. The author also had studied the collections stored in seven museums of Vologda and one in Archangelsk region

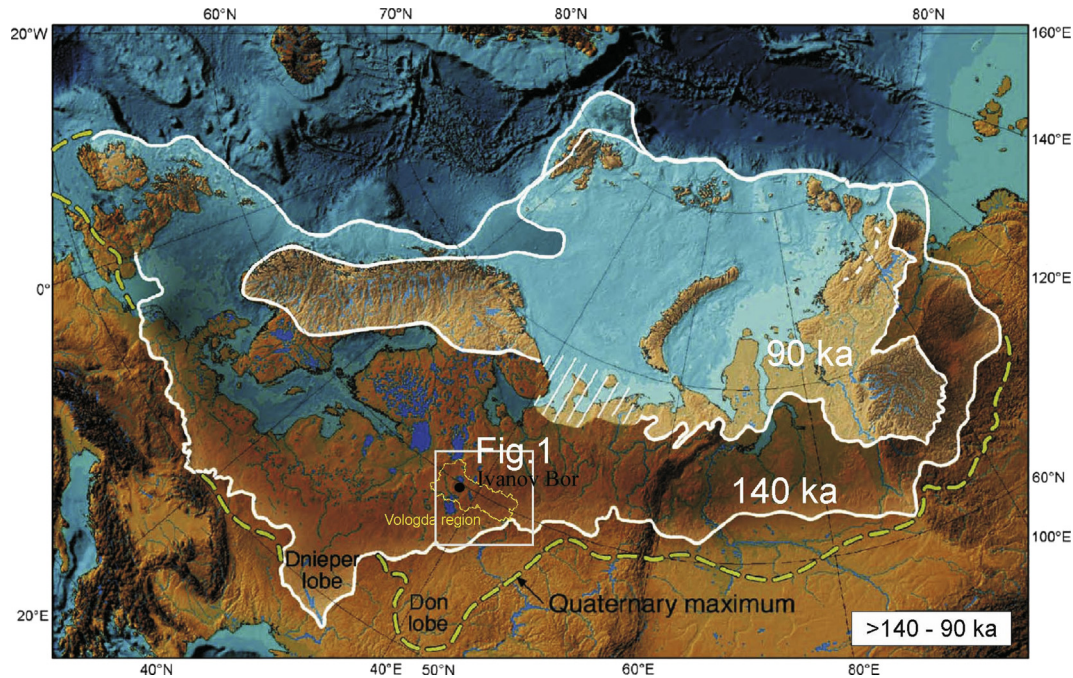


Fig. 1. Dynamics of ice cover change in the late Middle and early Late Pleistocene, 140–90 ka (Svendsen et al., 2004). The square shows the bounds of the studied area.

(the towns of Vologda, Cherepovets, Veliky Ustyug, Kirillov, Tot'ma, Velsk towns, the settlement of Ustye-Kubenskoye) and several private collections. In total, over 1000 bone remains of such large Late Pleistocene mammals had been analyzed (Fig. 1). Among them were 730 bones of the mammoth lineage, forest elephant (*E. (Palaeoloxodon) antiquus* – 1; woolly rhinoceros –30; bison –27; musk-oxen –19, and occasional finds of other animals.

3. Description of the most interesting finds located in the Sheksna Basin

3.1. Tooth of the forest elephant *E. (Palaeoloxodon) antiquus* (Table 1, Figs. 1, 3)

This interesting and unusual tooth was found near Ivanov Bor in 1925. The village of Ivanov Bor is situated on the right bank of the Sheksna River, 25 km southeast of Kirillov (Figs. 1 and 2). Apart from the tooth of the forest elephant, nearly ten bones of mammoth and bison were found.

Remains of animals were found in the western part of the outwash field framing the southern boundary of the Ostashkov (Late Weichselian) glacier. Sandur deposits lie on the Babushkin moraine (Upper Middle Pleistocene) (Gey et al., 2000). In the area of the former Ostashkov glacier, the Mikulino (Eemian) interglacial deposits are located. They are represented by lacustrine–palustrine and lacustrine–alluvial sediments. Part of the exposure was studied in the course of geological surveying carried out in the 1960–1980s. The conditions favorable for accumulation of fossil bones of animals occurred at the boundary with the peripheral moraine (Kirillov ridge). Irregularities of the pre-glacial surface also provided the formation of “traps” for organic fossils. Some finds of old animal bones were brought to the surface because glacial deposits were strongly eroded by waters of the Sheksna River while the others remained inside of the fluvio-glacial deposits and were exposed only during mining works. Unfortunately, these finds provide only indirect information on the habitat of these animals because they are related with fluvio-glacial deposits, are scarce, and might be displaced from the burial places. However, the maximum northern boundary of their areal range should be no further than 59°45'N.

Table 1

E. (Palaeoloxodon) antiquus from Ivanov Bor (Russia), dental measurements. L: length; W: width; P: plate number; LF: lamellar frequency; H: height; ET: enamel thickness; x – posterior and anterior talon. All measurements in mm.

Locality, M ³ specimen, N	P	L	W	H	LF	ET	H/L	W/L	W/H
Ivanov Bor (Russia) CHKM 11741	–13x	–238	76	–159 (XII)	6–6.5	2.15	>67	>32	48
Khuda-Dag (Turkmenistan) ZIN 27052 (Dubrovo, 1960)	19				4.5	3.25	71	30.3	
Shkurlat (Russia) (Shevyreva et al.1979)	18	315	87	205	6	2	65	28	
Kshen (Russia) N ^o 5007 (Chubur, 2004)	–11x	220	99			2.4			
Taubach Germany; IQW 1969/12143 (12819) (Guenther, 1977)	x12 ¹ / ₂ x	286	92	196	4.7	3 (IV)	68	32	48
Taubach Germany; IQW 1968/101 Taub.2917 (Guenther, 1977)	x15 ¹ / ₂ x	234–	74(VI)	155(X)	6.8	3.1	<66	<32	48
Taubach Germany; IQW 1971/3106 Taub.13502 (Guenther, 1977)	–6x	–141	81(III)	185 –(V)	4.6	3.0		<57	<44
Ehringsdorf Germany; IQW 8744 (Guenther, 1975)	–15 x	–245	84 (V)	199	6.3	3.0	<81	<34	42
Ehringsdorf Germany; IQW 10851 (Guenther, 1975)	–11 x	–206	84(IV)	–150	5.6	3.8	73	<41	<56
Veimar Germany; IQW 1972/13425 Wei 2114 (Guenther, 1984)	–10 x?	159–	87(VI)	202(IX)	6.3	2.1			43

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