



Dating North European mammoths (*Mammuthus primigenius* Blum.): a nearly continuous record from 53 ka to 11 ka

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Remains of the woolly mammoth (*Mammuthus primigenius* Blumenbach) are found all over Eurasia except in mountainous areas of Scandinavia and in western Iberian Peninsula. In the core area of the Scandinavian Ice Sheet, they are the only group of animal remains to have survived until today in abundant numbers, and so are an important source of information about the past fauna, their environment, and the climate.

Our data include mammoth remains found in Sweden, Denmark, Lithuania, Latvia, Estonia and Finland. Mammoth finds from northern Germany are not included in this study, but some dates have been published elsewhere. We lack data from northern Poland, but we include finds from southern Poland, approximately 500 km directly south of the main study area, as a point of comparison. Approximately 300 localities with mammoth molars, tusks and bones are known from the study area. Most of the finds (90%) are isolated skeletal elements. In marginal areas of the SIS, in Denmark and Lithuania, associated elements are also found together at some localities, but whole or partial skeletons are found only in southern Poland.

The mammoth data were collected by the authors from published papers and reports as well as by direct survey of museum collections. A total of 104 radiocarbon dates were documented: 78 from the circum-Baltic area and 26 from southern Poland. From the dates, 73 were previously published by the authors, and eight by other researchers. A total of 23 dates are new. Most of the specimens (93) were dated using AMS, and 11 using conventional radiocarbon dating. Finite dates were calibrated using the download version of CalPal-2007 (Weninger et al., 2008) with calibration data set CalPal-2007Hulu (Weninger and Jöris, 2007).

The spatio-temporal distribution of mammoth remains around the Baltic Sea suggests that the species was widely spread in north-eastern Europe during ice-free intervals of the Weichselian glaciation. Mammoths were present in north-eastern Europe nearly continuously from 53 ka to 11 ka, completely disappearing from the area only during the Last Glacial Maximum (LGM). From the northern parts of the study area, mammoths disappeared ca. 27 ka ago. In the south they survived until the LGM, and occupied the area again during deglaciation. Mammoths survived in the eastern part of the study area until the end of Younger Dryas.

References

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