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ABSTRACT BOOK

Editors:

Dimitris S. KOSTOPOULOS, Evangelos VLACHOS, and Evangelia TSOUKALA

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First discovery of Middle Pleistocene steppe mammoth (*Mammuthus trogontherii*) remains from northern China

Yuan WANG ✉, and Changzhu JIN

Mammuthus is one of the most prominent proboscidean taxa during the late Cenozoic through Eurasia (Lister et al., 2005). During the last several years, some achievements have been gained on the research of Chinese mammoth remains, and a Plio-Pleistocene biostratigraphic framework based on mammoth fossils of northern China has been established (Wei et al., 2010).

The earliest globally steppe mammoth (*Mammuthus trogontherii*) remains were recovered from Majuangou, Nihewan basin, China, with palaeomagnetic dating of 1.66 Ma (Wei et al., 2003; Wei and Lister, 2005). The mammoth remains recently found from Gaoling (Shaanxi Province) and Zalainuoer (Inner Mongolia) indicate that *Mammuthus*

trogontherii survived in northern China into the late Pleistocene (Wei et al., 2010). So North China is considered as the area of origin and extinction of *M. trogontherii*. However, no Middle Pleistocene steppe mammoth has been reported from northern China.

The present study deals with the new elephantid fossil remains, including one complete M3, a fragmentary incisor and some postcranial bones, which was recovered from the sandy deposits of an ancient channel from Shangyi, Hebei Province, northern China (Figure 1A and B). The occlusal surface of the new M3 (Figure 1C) bears typical morphological characters of *Mammuthus*. The enamel layers of the mesial and distal plate sides are parallel to each other in medium or advanced wear. In slightly worn lamellae the labio-lingual width of the central enamel loop is nearly equal to those of the two lateral enamel loops. A prominent and obtuse mesial and/or distal median sinus is developed in the central part. The M3 should be assigned to *Mammuthus trogontherii* while all the measurements of this molar, such as plate number (P), lamellar frequency (LF), enamel thickness (E), and width (W) and height (H) of crown, fall within the ranges of steppe mammoth.

The fine-grained and coarse quartz single-aliquot regenerative-dose (SAR) optically stimulated luminescence (OSL) results for six samples from Shangyi deposits indicate that the age of the steppe mammoth should be beyond the last interglacial (~130 ka). Furthermore, the ESR/U-series study (US-ESR model) based on a fossil tooth provides a more precise age of the mammoth remains, 410 ± 30 ka.

The first discovery of *Mammuthus trogontherii* from the Middle Pleistocene in northern China has significant implications for discussing the evolution, dispersal and paleoecological variation of *Mammuthus* lineage in Eurasia.

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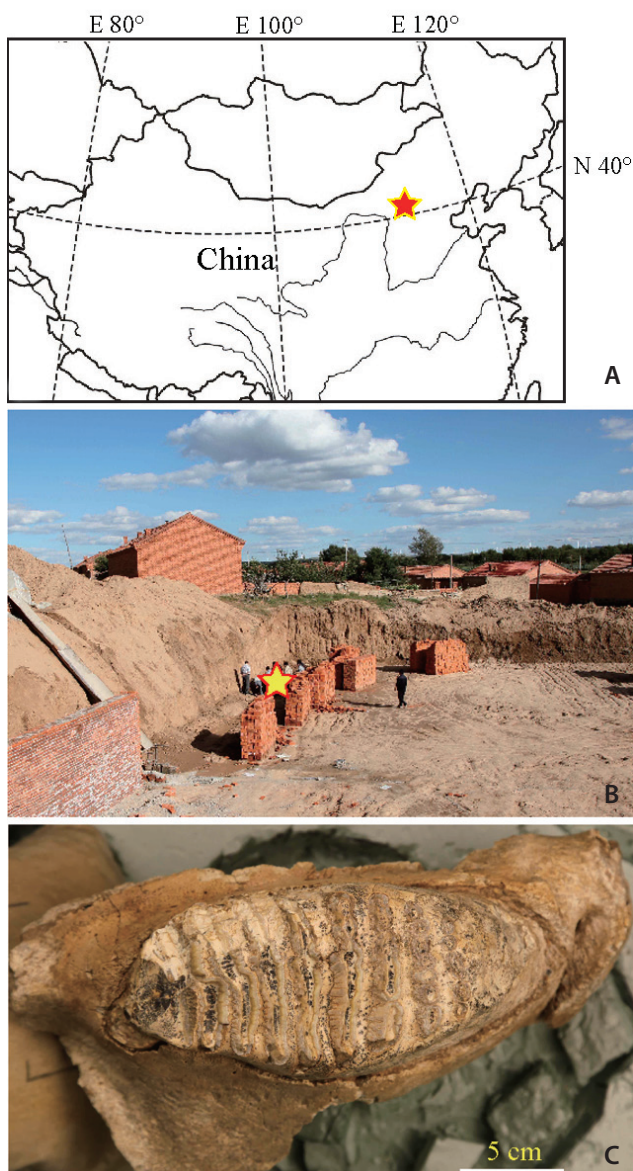


Fig. 1. Maps showing geographical location (A) and geomorphological landscape (B) of fossil site, as well as one complete M3 (C) of *Mammuthus trogontherii* from Shangyi, Hebei Province, northern China.

✉ xiaowangyuan@ivpp.ac.cn



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