



Elephantids from Pleistocene Poland: State of knowledge



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ABSTRACT

The presence of three elephant species (*Mammuthus trogontherii*, *Elephas (Palaeoloxodon) antiquus*, and *Mammuthus primigenius*) among fossil mammal assemblages from the Pleistocene has been established in Poland. The most abundant species in these finds is *Mammuthus primigenius*. Most fossil elephant remains have been provided by research from the 19th and 20th centuries, though there are more recent results from new localities. Recently obtained radiocarbon dates not only extend the existing data, but in two cases ($32,641 \pm 367$ cal. BP and $32,568 \pm 356$ cal. BP) also reveal the presence of mammoths in a time interval during which they were previously thought to have been absent from Poland. This allows us to shift the gap in the mammoths' occurrence in Poland from 32.0 to 32.6 cal. ka BP. This paper is intended to present the current state of knowledge concerning the diversity of elephants and their geographical and temporal variability in Poland in the Pleistocene.

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1. Introduction

Two genera of the Family Elephantidae are known from Pleistocene Eurasia: *Elephas* (the lineage of the living Asian elephant *E. maximus*), *Palaeoloxodon* (the straight-tusked elephant), and *Mammuthus* (the lineage of the mammoth) (Lister, 2004). The fossil assemblage is usually dominated by finds of woolly mammoth (*Mammuthus primigenius*), which is one of the representatives of the *Mammuthus*—*Coelodonta* Faunal Complex, designating the transregional expanded, cold-adapted large mammal assemblages of the Eurasian Pleistocene (Kahlke, 2014).

A catalogue of Pleistocene mammals from Poland was provided by Kowalski (1959), who gave a list of sites at which remains of elephantines had been found, along with data given in related publications. He summarized this elephantid research from the nineteenth and early twentieth centuries.

Subsequently, the history of the research into elephantid remains in Poland from the mid-nineteenth century to the early twentieth century was presented by Kubiak (1989), who mentioned a number of important studies (Rose, 1882; Volz, 1901;

1902; Wüst, 1901, 1902; Chłapowski, 1903; Kuźniar and Demetrykiewicz, 1909; Niezabitowski, 1912; Wiśniowski, 1914; Kulczycki, 1955; Kubiak, 1965a, 1965b; Jakubowski et al., 1968; Borsuk-Białynicka and Wysoczański-Minkowicz, 1969; Kozłowski et al., 1970; Ruprecht, 1971; Kubiak and Zakrzewska, 1974; Kubiak, 1980). Later finds have been reported by Wojtal (2007), Wiśniowski et al. (2009), Cieszkowski et al. (2010), Lorenc and Pawłowska (2010), and others. As a result, the presence of three elephant species (*Mammuthus trogontherii*, *Elephas (Palaeoloxodon) antiquus*, and *Mammuthus primigenius*) among fossil mammal assemblages from the Pleistocene has been established in Poland.

As recent studies have revealed new localities of fossil elephant remains, this paper summarizes the Polish localities with such finds. In total, 289 Polish localities are listed (Tables 1–3), including 25 new sites. Additionally, a new set of radiocarbon dates is presented from 7 localities. Accordingly, this paper is intended to present the current state of knowledge concerning the diversity of elephants and their geographical and temporal variability in Poland in the Pleistocene.

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Table 1
List of localities, contexts, and finds of *Mammuthus trogontherii* in Poland, 2015 data. Data sources: Kowalski (1959) with further references; Kubiak (1965a); Czyżewska and Wiszniowska (1982); Kubiak et al. (1989); Kubiak (2001); Pawłowska et al. (2014). Explanation: * hatches on the map.

Map	Localities	Powiat [county] (old name); Gmina [Municipality]	Year when found/Context/ Museum and institutions	Cranial material	Post-cranial material
1	Bełchatów	bełchatowski	Brown coal mine; IoES	Molars: upper M3, tusk,	Femur
2	Budy Jabłońskie near Jabłonica Polska	brzozowski (Doły Jasielsko-Sanockie)	1986; upper part of fluvial sand layer; SMK	Mandibula with M3, tusks	
3	Czystogarb near Komańcza	sanocki (Santok)	LSNHM	Molar: upper M3	
4	Frączków	nyski (Nysa)		–	
5	Jarosław	jarosławski (–)		Molars	
6	Katowice Piotrowice (Gliwice-Piotrowice)			–	
7	Łańcut	łańcucki (–)	LSNHM	Molar: lower M1	
8	Nosówka, Wisłoka river	rzeszowski (Rzeszów)	IGS	Molar: lower M3	
9	Oborniki	obornicki (–)	Gravel pit	–	
10	Przemyśl		LSNHM	Molar: lower M2	
11	Radyńno		LSNHM	Molar: lower M2	
12*	River San, Radyńno–Jarosław	jarosławski	OHMJ	Mandibula	
13	Rakoszyce	średzki (Środa Śląska)		–	
14	Oświęcim Stare Stawy (Stare Stawy)	oświęcimski (Oświęcim)	1936; near brickyard, 2 m depth; ISEA	Molar: upper M3	
15	Strzelin (Strzelin, vicinity of 'Baumgarten')	strzeliński (–)			

Table 2
List of localities, contexts, and finds of *Elephas (Palaeoloxodon) antiquus* in Poland, 2015 data. Data sources: Ślósarski (1883, 1884) in Niezabitowski (1912); Chłapowski (1903); Kowalski (1959) with further references; Kubiak (1965a); Rutkowski (1967) in Stankowski (1988); Jakubowski et al. (1968); Ruprecht, 1971 in Kubiak, 2001; Stankowski and Tobolski (1982) in Stankowski (1988); Dubrovo and Jakubowski (1988); Gorczyca (1988); Jakubowski (1988, 1996). Explanation: * hatches on the map.

Map	Localities	Powiat [county] (old name); Gmina [Municipality]	Year when found/Context/ Museum and institutions	Cranial material	Post-cranial material
1	Barycz near Brzozów	brzozowski (Brzozów)	LSNHM	Molar: lower M2	
2	Ciechanów, vicinity	ciechanowski	Groundworks; MZRM	Almost completely preserved skeleton, female	
3	Czechy near Środa Śląska	średzki (Środa Śląska)			
4	Hajnówka	hajnowski			
5	Imbramowice near Świdnica	świdnicki (Świdnica)			
6	Józwin near Konin	koniński, gm. Kleczew	1984; brown coal mine, upper part of silt layer with malacofauna; Eemian, 13 m depth; RMK	Almost completely preserved skeleton, male	
7	(A) Konin Kazimierz (B) Konin Marantów				Bones
8	Kraków, vicinity		Before 1903	Molar: upper M2	
9	Mława	mławski			
10	Oborniki	obornicki (–)	Before 1903; gravel pit	Molars: upper M2, lower M3	
11	Pawłowiczki near Kędzierzyn Koźle	kędzierzyński-kozielski (Koźle)	Gravel pit		
12	Przemyśl, San River				
13*	River San, Radyńno–Jarosław	jarosławski	OHMJ	Molars: two lower M3 and one lower M1	
14	Sokółka/Białystok	sokółski		Molars	
15	(A) Warszawa Bielany, Wisła river (B) Warszawa Leszno Street (C) Warszawa Szczęśliwice		Before 1887; gravel 1962; groundworks; MEW 1880–1882; 1935; clay, brickyard, interglacial layer	Molar Almost completely preserved skeleton, male Molars, mandibula	
16	Witków near Szprotawa	żagański (Szprotawa)			

Table 3
List of localities, contexts, and finds of *Mammuthus primigenius* in Poland, 2015 data. Data sources: Ślósarski (1883) in Chłapowski (1903); Kowalski (1959) with further references; Chmielewski and Kubiak (1962); Kubiak (1965a); Borówko-Dłużakowa (1967); Borsuk-Białynicka and Wysoczański-Minkowicz (1969); Jakubowski (1972); Kubiak (1980, 1989, 2001); Bluszcz and Pazdur (2003); Valde-Nowak et al. (2003) in Nadachowski et al. (2011); Kaczmarek (2004); Muzolf et al. (2009); Nadachowski et al. (2009); Stefaniak and Marciszak (2009); Stefaniak et al. (2009); Wiśniewski et al. (2009); Arppe and Karhu (2010); Cieszkowski et al. (2010); Nadachowski et al. (2011); Wilczyński et al. (2012); Borowska (2013); Nadachowski et al. (2014); Pawłowska et al. (2014); Żarski et al. (2014); Woroncowa-Marcinowska et al. (forthcoming); Pawłowska, unpublished data; Pawłowska (2015), and local museums; Stefaniak (personal communication). Explanation: * hatches on the map; ** new localities; *** new finds.

Map	Localities (old name)	Powiat [county] (old name); Gmina [Municipality]	Year when found/Context/ Museum and institutions	Cranial material	Post-cranial material
1	Bałtów near Kielc	ostrowiecki (–)	LSNHM	Molar: upper M3	
2	Barycz	brzozowski (Brzozów)			
3	Bełchatów***	bełchatowski	BBCMM; IoES	Cranium, teeth; molar, tusk	Bones; atlas, thoracic vertebra, tibia
4	Bębło, Jaskinia Bębłowska Dolna	krakowski (Olkusz)	Lower layer		
5	Bielinek**	gryfiński	RMC	Tusk, molars	Humerus, femur, scapula
6	Birów, cave IV	zawierciański, gm. Ogrodzieniec	1990–1994; DPW	Fragment of juvenile teeth	
7	Bisztynek	bartoszycki (Reszel)			

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