

SUPPLEMENTARY ONLINE MATERIAL FOR

***Palaeoloxodon antiquus* from Contrada Monticelli in Apulia, Southern Italy:  
a new insight to the postcranial anatomy of Pleistocene European Elephantidae**

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**Supplementary Online Material**

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**References**

**SOM 3.** 3D model of elephant skeletal material embedded in a block available at [http://app.pan.pl/SOM/app71-Stefanelli\\_etal\\_SOM/SOM\\_3.glb](http://app.pan.pl/SOM/app71-Stefanelli_etal_SOM/SOM_3.glb)

SOM 1: Table 1. List of Elephantidae fossil finds from Contrada Monticelli (southern Italy, early Middle Pleistocene) studied in this work.

ID specimen	Anatomical portion	Age	Side	Notes
MSTB-CM 30531	Tooth	Adult	/	
MSTB-CM 30559	Tusk	Adult	/	Intermediate portion
MSTB-CM 30560	Tusk	Adult	/	Distal fragment, highly fractured
MSTB-CM 30562	Humerus (?)	Adult	/	Fragment
MSTB-CM 30563	Tibia	Adult	Right	Joined to MSTB-CM 30564
MSTB-CM 30564	Rib	Adult	/	Joined to MSTB- CM 30563
MSTB-CM 30566	Radius	Adult	Right	Approximately 2/3 proximal
MSTB-CM 30567	Humerus (?)	Adult	/	Fragment
MSTB-CM 30568	Humerus (?)	Adult	/	Fragment
MSTB-CM 30569	Rib	Adult	/	Associated with a fragment indicated XZ24
MSTB-CM 30570	Femur	Adult	/	Articular head
MSTB-CM 30571	Ulna	Adult	Right	
MSTB-CM 30572	Rib	Adult	/	
MSTB-CM 30573	Rib	Adult	/	Associated with another fragment with the same number (in red)
MSTB-CM 30574	Rib	Adult	/	
MSTB-CM 30575	Rib	Adult	/	
MSTB-CM 30576	Rib	Adult	/	
MSTB-CM 30577	Rib	Adult	/	
MSTB-CM 30581	Scapula	Adult	/	
MSTB-CM 30582	Vertebra	Adult	/	
MSTB-CM 30583	Vertebra	Adult	/	
MSTB-CM 30584	Metapodial	Adult	/	
MSTB-CM 30585	Scapula	Adult	Right	Abraded and with other fragments
MSTB-CM 30586	Femur	Adult	Left	Joined to MSTB-CM 30587
MSTB-CM 30587	Radius (?)	Adult	/	Joined to MSTB-CM 30586
MSTB-CM 30588	Humerus	Adult	Left	Approximately 1/2 distal
MSTB-CM 30668	Tusk	Adult	/	Intermediate portion
MSTB-CM 30676	Rib	Adult	/	
MSTB-CM 30709	Tooth	Adult	/	block of bones with sediment with MSTB-CM 30710, 30711
MSTB-CM 30812	Rib	Adult	/	Higly fractured, with an initials (in red) XZ24
MSTB-CM QF59a, b	Tusk (a), tooth (b)	Adult	/	Joined together
MSTB-CM 30812	Tooth fragment	Adult	/	

**SOM 1: Table 2.** Description and measurements used for the humerus, ulna, femur, and tibia of Elephantidae specimens from the Museum of Earth Sciences of the University of Bari (MSTB), the Museum of Geology and Paleontology of the University of Florence (IGP), and the University Museum of Earth Sciences of Sapienza the University of Rome (MPUR). \*estimated measure

<b>Humerus</b>									
Abbreviation in Göhlich (1998)	Abbreviation in this work	Description	MSTB-CM 30588	IGF 1058	IGF 10791	IGF 14838	IGF 318	MPUR/ U (L)	MPUR/ U (R)
GL	1	Maximum length of the bone			1111*	1302		1130	1230
Lph	2	Physiological length		1150				1080	1190
GLC	3	Greatest length from the caput humeris		1160		1290	1200*		
Bp	4	Proximal width		281*		302		280	273
Tp	5	Proximal depth		350	394	400		350	410
BD	6	Diaphysis smallest width	164	155	165	148	150	135	146
UD	7	Diaphysis smallest circumference	542	525	530	500	560*	620	565
Bd	8	Distal width	341	337	303	338	320	320	340
Td	9	Distal depth	225	227	231	200	199	231	239
BTr	10	Trochlea width	304	223	255	269	255	268	284

<b>Ulna</b>									
Abbreviation in Göhlich (1998)	Abbreviation in this work	Description	MSTB - CM 30571	IGF 14838	IGF 13094	IGF 10791	IGF 1058	MPUR/ U (L)	MPUR/ U (R)
GL	1	Maximum length of the bone	1130	1060	880*	960	1085	1060	990
Bp	2	Proximal width to the coronoid process	268	272	228	257	332	264	284
Tp	3	Proximal depth	344	368	312	323	320		
LI	4	Trochlear notch length	160					158	170
BTb	5	Width over the olecranon tuberosity		245	105*	196	238	200	216
TP	6	Smallest depth from the anconeal process to the volar ulnar edge		260*	196*	225	300	365	370
BD	7	Diaphysis smallest width	152	110	92	121	142	65	55*
TD	8	Diaphysis smallest depth	168	122	100	129	142	174	157
UD	9	Diaphysis smallest circumference	480	420	320	400	500	490	480
Bd	10	Distal width	179*	210*	143*		223	286	290
Td	11	Distal depth	189*	240	162*	196*	230	256	238
BF	12	Width of the facies articularis carpea	159	152*			152	138	132



**SOM 1: Table 3.** Measurements on the teeth of the specimen from Contrada Monticelli (southern Italy, early Middle Pleistocene), compared with those of four other species of large Elephantidae from the European Pleistocene.\*estimated measure

Species	<i>Mammuthus meridionalis</i>	<i>Mammuthus trogontherii</i>	<i>Mammuthus primigenius</i>	<i>Palaeoloxodon antiquus</i>	<b>MSTB-CM QF59b</b>
Length (min.–max.)	220.0–330.0	230.0–397.0	215.0–326.0	245.3–332.6	<b>302*</b>
L mean	259.7	301.1	255.6	291.7	
Width (min.–max.)	74.0–121.5	77.0–123.0	79.5–119.5	69.0–92.0	<b>70</b>
W mean	97.4	101.6	97.0	80.1	
Height (min.–max.)	104.0 – 146.0	147.0–210.0	148.0–206.0	140.0–194.0	<b>&gt;133.4</b>
H mean	121.5	181.2	180.5	168.5	
Lamellar Frequency (min–max)	4.5–6.4	5.8–8.9	7.6–11.8	5.4–7.4	<b>5</b>
LF mean	5.4	7	9.5	6.2	
Number of specimens	L: 17; W: 34; H: 19; LF: 33	L: 20; W: 54; H: 29; LF: 54	L: 12; W: 38; H: 5; LF: 44	L: 7; W: 22; H: 11; LF: 26	<b>1</b>
Reference	Herridge (2010)	Lister (2022)	Lister (2022)	Herridge (2010)	This work

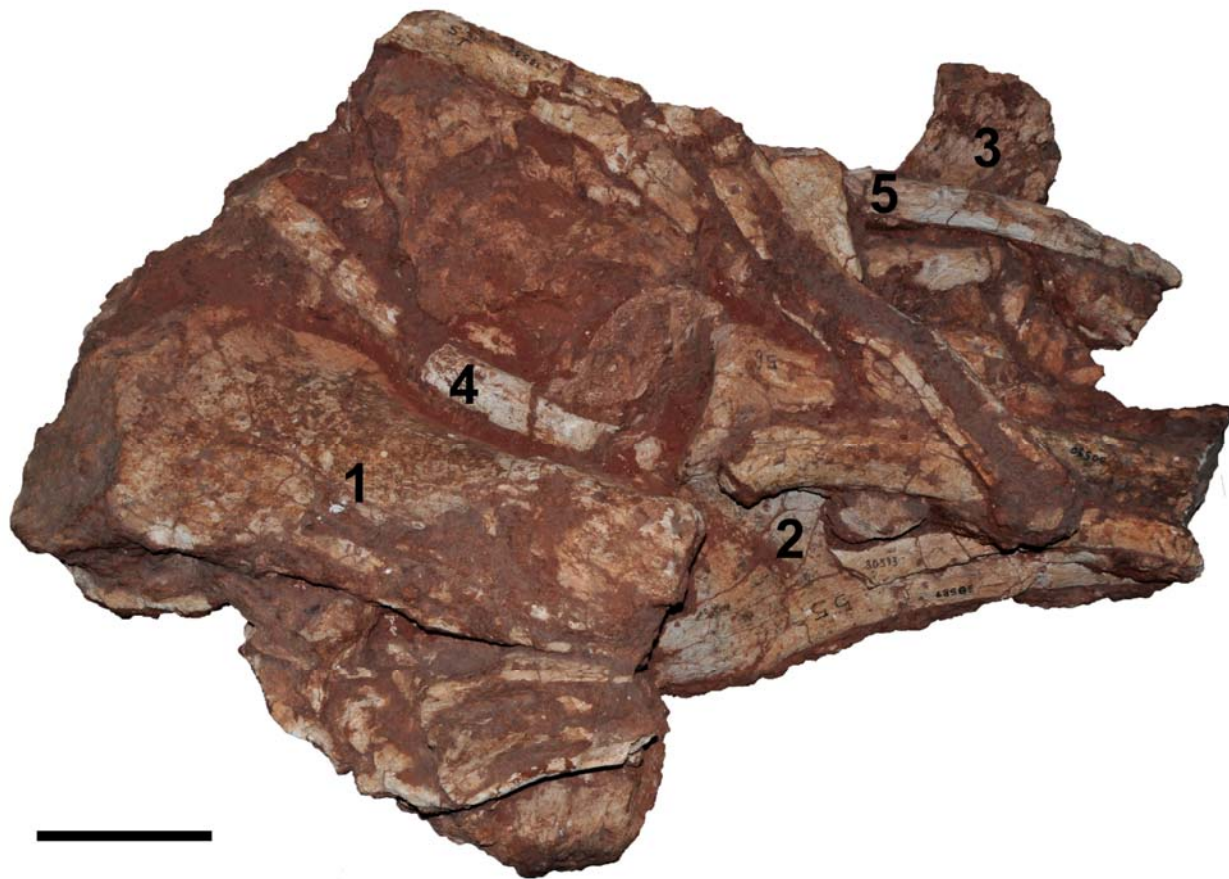
**SOM 1: Table 4.** Dataset of Elephantidae humerus, ulna, femur, and tibia measurements used for comparison in this work.

Available at [http://app.pan.pl/SOM/app71-Stefanelli\\_etal\\_SOM/SOM\\_1\\_table4.xlsx](http://app.pan.pl/SOM/app71-Stefanelli_etal_SOM/SOM_1_table4.xlsx)

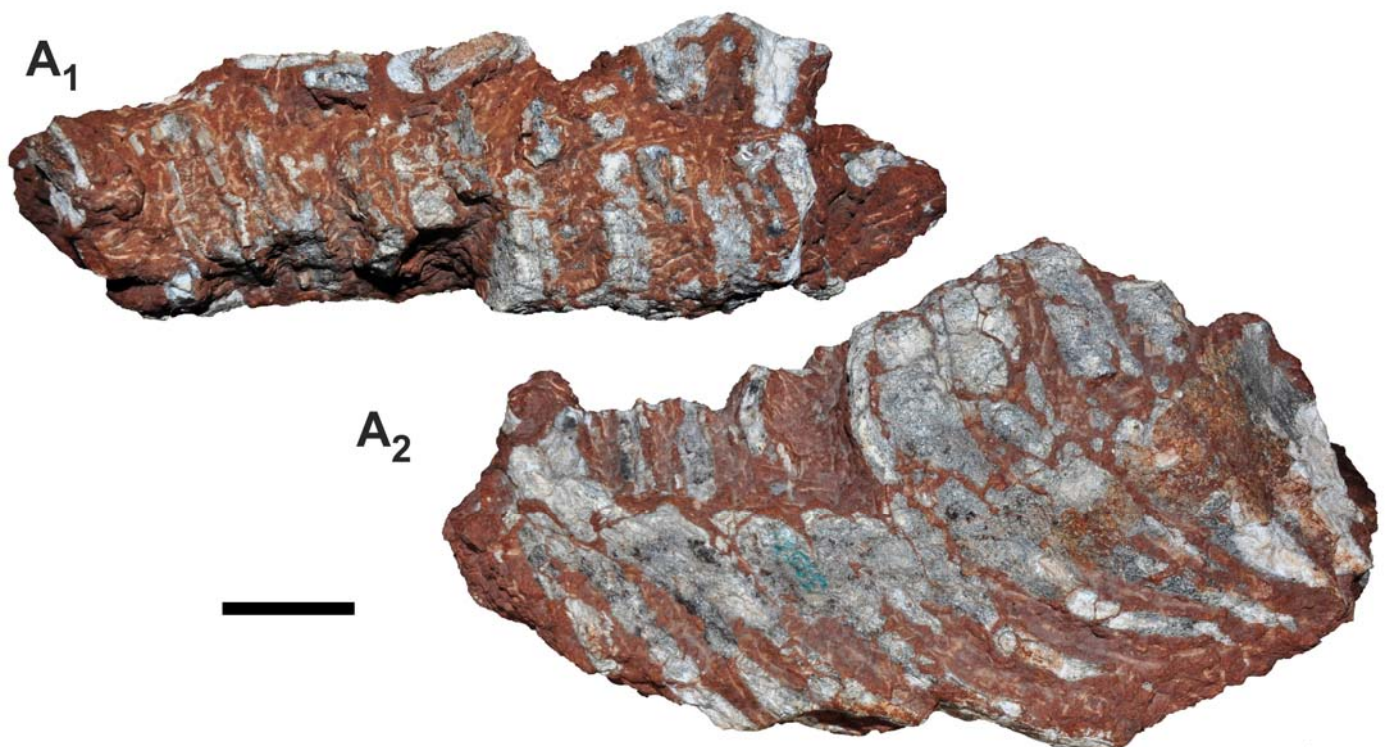
**SOM 1: Table 5.** Dataset of shoulder heights and body masses of *Palaeoloxodon antiquus* individuals used for comparison in this work.

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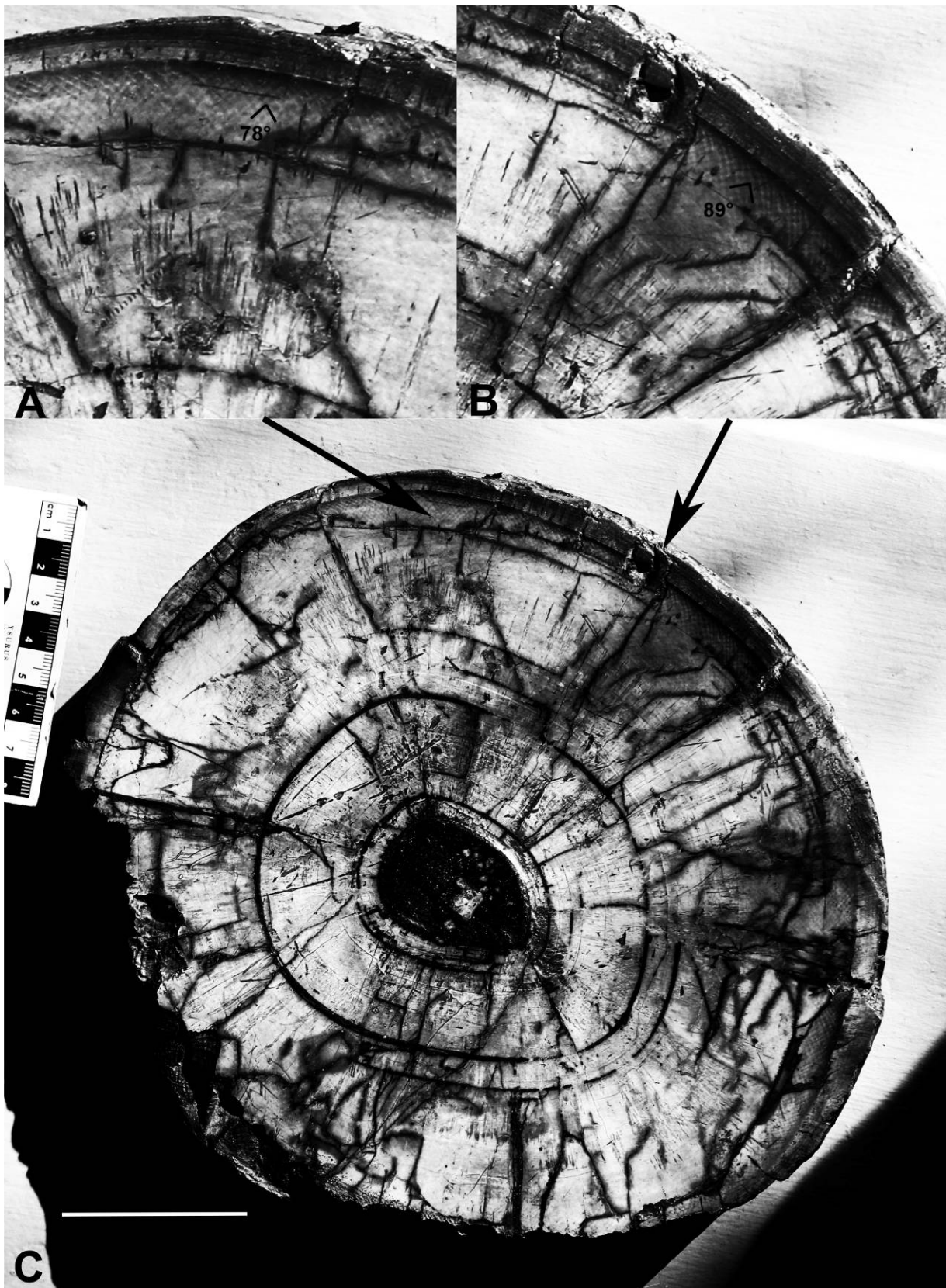
**SOM 2: Fig. 1.** Block of bone remains of *Palaeoloxodon antiquus* (Falconer & Cautely, 1847) from Contrada Monticelli (southern Italy, early Middle Pleistocene) with reddish sand. 1: right femur; 2: left scapula; 3: ? mandibular fragment; 4 and 5: ribs. Scale bar: 20 cm.



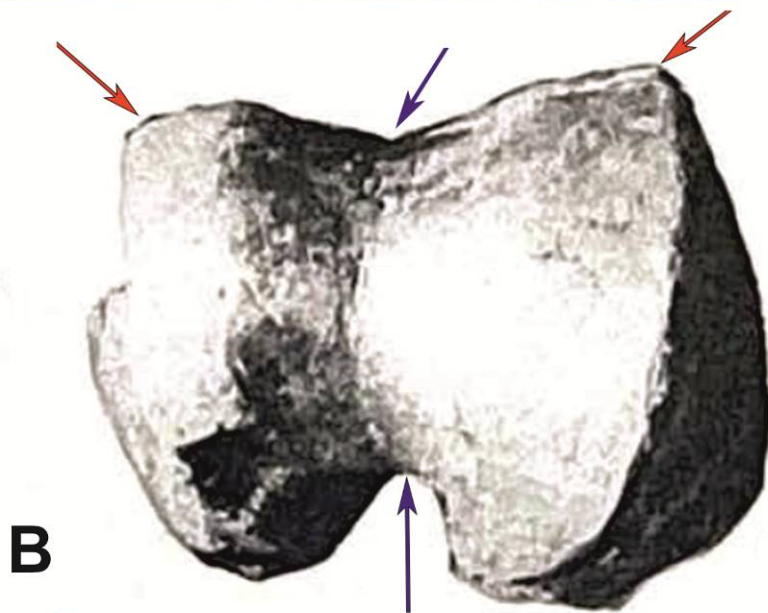
**SOM 2: Fig. 2.** Right M<sub>3</sub> (MSTB-CM 30531) of *Palaeoloxodon antiquus* (Falconer & Cautely, 1847) from Contrada Monticelli (southern Italy, early Middle Pleistocene) in occlusal (A<sub>1</sub>) and lingual (A<sub>2</sub>) views. Scale bar: 5 cm.



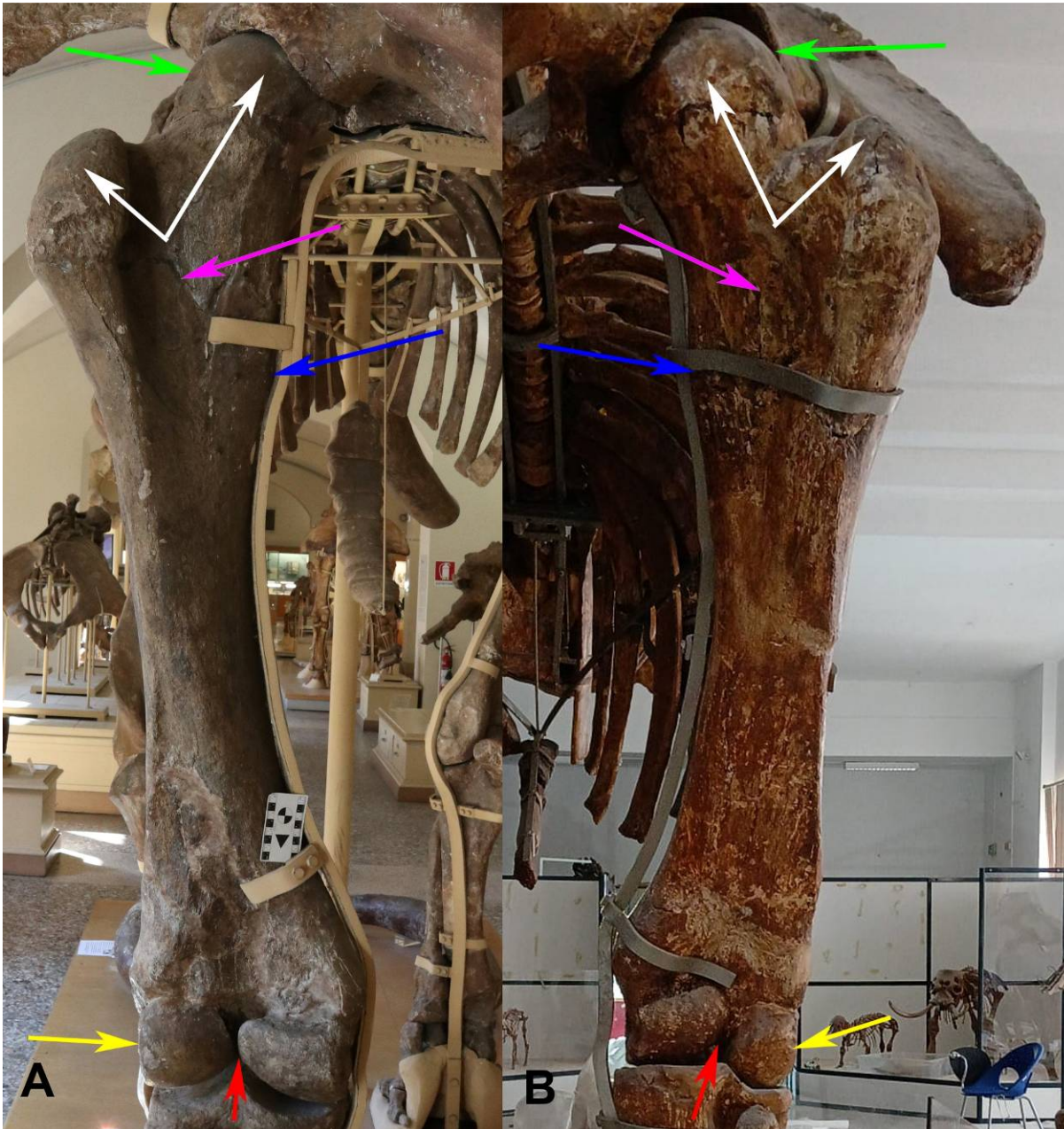
**SOM 2: Fig. 3.** Transverse section of the proximal portion of the tusk (IGF 305) of *Mammuthus meridionalis* (Nesti, 1825) from Valdarno (Italy, Pleistocene), with increased contrasts (C). In the portion in which the Schreger pattern stands out, the angles were measured, obtaining measures of about 78° (A) and about 89° (B). Scale bar: 5 cm.



**SOM 2: Fig. 4.** Variability of the profile of the trochlea of the humerus (character 5; blue arrows), and of the lateral and medial edges of the trochlea (character 7; red arrows), seen in distal view. A, left humerus (IGF 14838) of *Mammuthus meridionalis* (Nesti, 1825) from Valdarno (Italy, Pleistocene); B, right humerus (IGF unnumbered specimen) of *Palaeoloxodon antiquus* (Falconer & Cautely, 1847) from Fonte Campanile, Viterbo (Italy, Pleistocene; after Trevisan 1949); C, left humerus (MSTB-CM 30588) of *P. antiquus* from Contrada Monticelli (Italy, Pleistocene). Not to scale.



**SOM 2: Fig. 5.** Characters of the femur, described in the text (see Table 2 in the main text), as observed in a left femur (IGF 10791) of *Mammuthus meridionalis* (Nesti, 1825) from Valdarno (Italy, Pleistocene) (A) and in a right femur (MUT unnumbered specimen) of *Palaeoloxodon antiquus* from Fonte Campanile, Viterbo (Italy, Pleistocene) (B), seen in caudal view. Character 1: blue arrow; character 2: red arrow; character 4: yellow arrow; character 7: green arrow; character 8: white arrow. The magenta arrow indicates the trochanteric fossa in both specimens. Not to scale.



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**SOM 3.** 3D model of elephant skeletal material embedded in a block available at [http://app.pan.pl/SOM/app71-Stefanelli\\_etal\\_SOM/SOM\\_3.glb](http://app.pan.pl/SOM/app71-Stefanelli_etal_SOM/SOM_3.glb)