

# Supplementary Information 2: Lists of specimens used in the analyses

## Cranial and mandibular morphology of Middle Pleistocene cave bears (*Ursus deningeri*): implications for diet and evolution

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## Maseter Analyses

Supplementary table 2.1: List of specimens used in the analyses of the mandible with seven landmarks focusing on masseter functional morphology and their locality. *U. arctos fossilis*, *U. deningeri* and *U. spelaeus* are fossils. Longitude and latitude are given in degrees and altitude is given in meters above sea level. Abbreviations under ID: JM=Landesmuseum Joanneum, Graz, Austria; MCNB=Museu de Ciències Naturals de Barcelona, Barcelona, Spain; MZUF=Museum of Zoology and Natural History “La Specola”, Firenze, Italy; BM(NH)=Natural History Museum, London, UK; ZMUO=Natural History Museum, University of Oslo, Oslo, Norway; KBIN=Royal Belgian Institute of Natural Sciences; MLT=Staatliches Museum für Naturkunde Stuttgart, Museum am Löwentor, Stuttgart, Germany; UWIEN=Universität Wien, Vienna, Austria; ULg=Université de Liège, Liège, Belgium; HdN=Haus der Natur, Salzburg, Austria; MNCN=Museo Nacional de Ciencias Naturales, Madrid, Spain; MNHU=Museum für Naturkunde, Leibnitz-Institut für Evolutions- und Biodiversitätsforschung and der Humboldt Universität, Berlin, Germany; NMW=Naturhistorisches Museum Wien, Vienna, Austria; NMP=Národní Museum Praha, Prague, Czech Republic; PR=Prehistosite Ramioul, Ramioul, Belgium; TAU=Musée de Préhistoire de Tautavel, T. Abbreviations under sex: f=female; m=male; u=unsexed. (Continued on the following pages.)

ID	species	subspecies	sex	longi- tude	lati- tude	alti- tude
BM(NH) 39.3808	<i>A. melanoleuca</i>		m	103.75	32.25	2000
BM(NH) 9.7.21.3	<i>A. melanoleuca</i>		u	103.75	32.25	2000
BM(NH) 55.587	<i>A. melanoleuca</i>		u	103.75	32.25	2000
BM(NH) 55.591	<i>A. melanoleuca</i>		u	103.75	32.25	2000
BM(NH) 96.8.20.1	<i>A. melanoleuca</i>		u	103.75	32.25	2000
BM(NH) 15.12.1.9	<i>H. malayanus</i>		f	98.75	14.25	150
BM(NH) 1938.11.30.70	<i>H. malayanus</i>	<i>malayanus</i>	f	97.75	4.75	79

ID	species	subspecies	sex	longi- tude	lati- tude	alti- tude
BM(NH) 1938.11.30.69	<i>H. malayanus</i>	<i>malayanus</i>	m	97.75	4.75	79
BM(NH) 79.11.21.198	<i>H. malayanus</i>		m	101.75	6.25	30
BM(NH) 55.734	<i>H. malayanus</i>	<i>euryspilus</i>	u	112.75	2.75	600
BM(NH) 35.1.1.4	<i>M. ursinus</i>		f	76.75	11.25	600
BM(NH) 36.1.22.1	<i>M. ursinus</i>	<i>inornatus</i>	f	80.25	8.25	50
BM(NH) 36.1.22.2	<i>M. ursinus</i>		f	80.75	7.75	25
BM(NH) 20.10.27.5	<i>M. ursinus</i>	<i>ursinus</i>	m	87.25	22.25	94
BM(NH) 20.10.27.6	<i>M. ursinus</i>	<i>ursinus</i>	m	87.25	22.25	94
BM(NH) 24.10.5.12	<i>M. ursinus</i>	<i>ursinus</i>	m	85.75	22.75	400
BM(NH) 32.5.7.9	<i>M. ursinus</i>	<i>ursinus</i>	m	80.75	22.25	594
BM(NH) 36.1.22.4	<i>M. ursinus</i>		m	80.25	9.25	70
BM(NH) 36.1.22.6	<i>M. ursinus</i>		m	81.25	6.25	600
BM(NH) 32.8.14.1	<i>M. ursinus</i>		u	77.75	24.75	130
BM(NH) 220h	<i>M. ursinus</i>		u	85.25	23.75	600
BM(NH) 24.10.5.14	<i>M. ursinus</i>	<i>ursinus</i>	u	85.25	23.75	600
BM(NH) 9.6.1.18	<i>M. ursinus</i>	<i>ursinus</i>	u	76.25	12.25	790
BM(NH) 31.1.10.8	<i>M. ursinus</i>	<i>ursinus</i>	u	77.25	21.25	400

ID	species	subspecies	sex	longi- tude	lati- tude	alti- tude
BM(NH) 31.1.10.9	<i>M. ursinus</i>	<i>ursinus</i>	u	77.25	21.25	400
BM(NH) 9.7.26.1	<i>T. ornatus</i>		f	-71.25	8.75	1630
BM(NH) 27.11.1.71	<i>T. ornatus</i>		m	-8.25	-76.25	500
BM(NH) 34.9.2.70	<i>T. ornatus</i>		m	-66.25	-17.25	2540
BM(NH) 55.12.24.309	<i>T. ornatus</i>		u	0	-78.25	1900
BM(NH) 73.6.27.4	<i>T. ornatus</i>		u	-69.75	-12.75	200
BM(NH) 73.6.27.5	<i>T. ornatus</i>		u	-69.75	-12.75	200
BM(NH) 1939.3617	<i>T. ornatus</i>		u	-69.75	-12.75	1500
NMW 8271	<i>U. americanus</i>		f	-142.75	63.25	500
NMW 8269	<i>U. americanus</i>		m	-142.75	63.25	500
BM(NH) 61.1286	<i>U. americanus</i>		m	-151.25	59.75	0
BM(NH) 61.1287	<i>U. americanus</i>		m	-149.75	61.75	70
BM(NH) 76.197	<i>U. americanus</i>		u	-153.75	63.75	350
NMW 63555	<i>U. americanus</i>		u	-153.75	63.75	350
NMW 64947	<i>U. americanus</i>		u	-141.75	64.75	1700
BM(NH) 2002.124	<i>U. americanus</i>		u	-74.75	43.25	400
BM(NH) 42.79	<i>U. americanus</i>		u	-106.25	56.25	500

ID	species	subspecies	sex	longi- tude	lati- tude	alti- tude
BM(NH) 12.5.15.2	<i>U. americanus</i>		u	-128.75	52.75	150
BM(NH) 31.6.1.1	<i>U. arctos</i>	<i>syriacus</i>	f	43.75	44.25	1200
BM(NH) 1010g	<i>U. arctos</i>	<i>syriacus</i>	m	39.25	34.75	500
BM(NH) 31.2.2.1	<i>U. arctos</i>	<i>isabellinus</i>	f	75.25	34.75	4000
BM(NH) 32.12.15.1	<i>U. arctos</i>	<i>isabellinus</i>	f	77.25	31.75	1200
BM(NH) 42.81	<i>U. arctos</i>	<i>isabellinus</i>	f	74.75	34.25	1800
BM(NH) 87.5.5.3	<i>U. arctos</i>	<i>isabellinus</i>	f	74.75	34.25	3000
BM(NH) 92.10.9.1	<i>U. arctos</i>	<i>pruinusus</i>	f	91.25	29.75	4000
BM(NH) 31.1.6.1	<i>U. arctos</i>	<i>isabellinus</i>	m	78.25	30.75	3260
BM(NH) 32.5.6.1	<i>U. arctos</i>	<i>isabellinus</i>	m	74.75	34.25	1800
BM(NH) 56.9.22.21	<i>U. arctos</i>	<i>isabellinus</i>	m	74.75	34.25	3000
BM(NH) 87.5.15.2	<i>U. arctos</i>	<i>isabellinus</i>	m	74.75	34.25	3000
BM(NH) 29.5.24.1	<i>U. arctos</i>	<i>arctos</i>	f	31.25	60.75	5
BM(NH) 88.2.20.16	<i>U. arctos</i>	<i>beringianus</i>	f	159.75	56.75	500
BM(NH) 88.2.20.18	<i>U. arctos</i>	<i>beringianus</i>	f	159.75	56.75	500
BM(NH) 90.8.1.3	<i>U. arctos</i>	<i>arctos</i>	f	18.75	67.25	700
BM(NH) 1991.216	<i>U. arctos</i>	<i>arctos</i>	f	92.25	53.25	2350

ID	species	subspecies	sex	longi- tude	lati- tude	alti- tude
BM(NH) 19.7.7.3609	<i>U. arctos</i>	<i>arctos</i>	m	31.25	60.75	5
BM(NH) 19.7.7.3610	<i>U. arctos</i>	<i>beringianus</i>	m	159.75	56.75	500
BM(NH) 88.2.20.15	<i>U. arctos</i>	<i>beringianus</i>	m	159.75	56.75	500
BM(NH) 1991.217	<i>U. arctos</i>	<i>arctos</i>	m	92.25	53.25	2350
MZUF 11884	<i>U. arctos</i>	<i>marsicanus</i>	f	13.75	42.25	2000
ZMUO 81-57	<i>U. arctos</i>	<i>arctos</i>	m	12.75	61.25	500
ZMUO 129-58	<i>U. arctos</i>	<i>arctos</i>	m	12.75	61.25	500
ZMUO 348-49	<i>U. arctos</i>	<i>arctos</i>	m	11.75	61.75	500
ZMUO 11847	<i>U. arctos</i>	<i>arctos</i>	m	11.75	60.75	350
MZUF 11883	<i>U. arctos</i>	<i>arctos</i>	m	9.75	45.25	200
ZMUO247	<i>U. arctos</i>	<i>arctos</i>	u	11.75	60.25	203
MZUF 3584	<i>U. arctos</i>	<i>marsicanus</i>	u	13.75	42.25	2000
MZUF 7376	<i>U. arctos</i>	<i>arctos</i>	u	9.25	60.25	800
MZUF 7377	<i>U. arctos</i>	<i>arctos</i>	u	9.25	60.25	800
MZUF 7379	<i>U. arctos</i>	<i>arctos</i>	u	9.25	60.25	800
NMW 7793	<i>U. arctos</i>	<i>horribilis</i>	u	-133.25	61.75	800
NMW 41251	<i>U. arctos</i>	<i>horribilis</i>	u	-159.75	63.75	300

ID	species	subspecies	sex	longi- tude	lati- tude	alti- tude
BM(NH) 78.6.18.1	<i>U. arctos</i>	<i>horribilis</i>	u	-133.25	61.75	800
ZMUO 7384	<i>U. arctos</i>	<i>arctos</i>	u	9.25	60.25	800
NMW KL3	<i>U. arctos</i>	<i>fossilis</i>	u	15.75	47.25	480
PR our brun	<i>U. arctos</i>	<i>fossilis</i>	u	5.75	50.75	90
ULg 9039	<i>U. arctos</i>	<i>fossilis</i>	u	4.75	50.25	200
KBIN 2555-2	<i>U. arctos</i>	<i>fossilis</i>	u	4.75	50.25	200
TAU 456A	<i>U. deningeri</i>		u	2.25	42.75	170
BM(NH) M6186b	<i>U. deningeri</i>		u	1.25	52.75	0
MCMB V7119	<i>U. deningeri</i>		u	-3,50	43,50	322
ZMUO-370-65-62	<i>U. maritimus</i>		f	5.75	58.75	0
ZMUO-370-65-68	<i>U. maritimus</i>		f	5.75	58.75	0
BM(NH) 41.1.19.7	<i>U. maritimus</i>		f	5.75	58.75	0
ZMUO-370-65-66	<i>U. maritimus</i>		m	5.75	58.75	0
BM(NH) 43.6.23.11	<i>U. maritimus</i>		u	-95.75	74.75	0
BM(NH) 1937.5.6.1	<i>U. maritimus</i>		u	-32.75	68.25	0
BM(NH) 1937.5.6.3	<i>U. maritimus</i>		u	-32.75	68.25	0
BM(NH) 1937.5.6.4	<i>U. maritimus</i>		u	-32.75	68.25	0

ID	species	subspecies	sex	longi- tude	lati- tude	alti- tude
BM(NH) 1937.5.6.5	<i>U. maritimus</i>		u	-32.75	68.25	0
BM(NH) 1937.11.3.2	<i>U. maritimus</i>		u	-21.75	73.25	0
BM(NH) 29.7.24.3	<i>U. maritimus</i>		u	54.75	80.75	0
BM(NH) 29.7.24.6	<i>U. maritimus</i>		u	54.75	80.75	0
BM(NH) 46.12.29.211g	<i>U. maritimus</i>		u	5.75	58.75	0
UWIEN GS33-15	<i>U. spelaeus</i>	<i>ingressus</i>	u	47.75	14.25	1300
UWIEN GS150-4	<i>U. spelaeus</i>	<i>ingressus</i>	u	47.75	14.25	1300
JM 739	<i>U. spelaeus</i>		u	47.25	15.25	419
NMW MS27	<i>U. spelaeus</i>	<i>ingressus</i>	u	47.75	16.25	441
NMW MS34	<i>U. spelaeus</i>	<i>ingressus</i>	u	47.75	16.25	441
NMW MS45	<i>U. spelaeus</i>	<i>ingressus</i>	u	47.75	16.25	441
UWIEN A16	<i>U. spelaeus</i>	<i>ingressus</i>	u	47.25	15.25	949
NMW SL3	<i>U. spelaeus</i>		u	47.25	13.75	1980
ULg 9045	<i>U. spelaeus</i>		u	4.75	50.25	200
NMW C1003	<i>U. spelaeus</i>		u	49.25	16.75	500
MLT 34156.121	<i>U. spelaeus</i>	<i>spelaeus</i>	u	48.25	10.25	485
MLT 34151.597	<i>U. spelaeus</i>	<i>spelaeus</i>	u	48.25	10.25	485



ID	species	subspecies	sex	longi- tude	lati- tude	alti- tude
UWIEN KJ228	<i>U. spelaeus</i>	<i>ingressus</i>	u	45.75	14.25	534
BM(NH) 30.3.1.2	<i>U. thibetanus</i>	<i>thibetanus</i>	f	78.25	30.25	900
BM(NH) 30.5.21.1	<i>U. thibetanus</i>	<i>laniger</i>	f	74.25	26.25	2150
BM(NH) 95.2.21.6	<i>U. thibetanus</i>	<i>ussuricus</i>	f	127.75	50.25	230
BM(NH) 26.10.8.41	<i>U. thibetanus</i>		m	77.75	30.75	2750
BM(NH) 27.2.7.4	<i>U. thibetanus</i>	<i>laniger</i>	m	75.75	34.25	3000
BM(NH) 33.2.4.3	<i>U. thibetanus</i>		m	79.75	29.75	1500
BM(NH) 95.2.21.5	<i>U. thibetanus</i>	<i>ussuricus</i>	m	127.75	50.25	230
BM(NH) 26.10.8.42	<i>U. thibetanus</i>	<i>thibetanus</i>	u	77.75	30.75	2450
BM(NH) 80.3.20.30	<i>U. thibetanus</i>	<i>japonicus</i>	u	135.75	34.75	40
BM(NH) 219g	<i>U. thibetanus</i>		u	94.75	35.25	1470

## Mandibular Corpus Analyses

Supplementary table 2.2: List of specimens used in the analyses of the mandible with thirteen landmarks and their locality.

The specimens that have an entry under 'locality' are fossils. Longitude and latitude are given in degrees and altitude is given in meters above sea level. Abbreviations under ID: AM=Arkeologi Museoa, Bilbao, Spain; JM=Landesmuseum Joanneum, Graz, Austria; MCNB=Museu de Ciències Naturals de Barcelona, Barcelona, Spain; MZUF=Museum of Zoology and Natural History "La Specola", Firenze, Italy; BM(NH)=Natural History Museum, London, UK; ZMUO=Natural History Museum, University of Oslo, Oslo, Norway; KBIN=Royal Belgian Institute of Natural Sciences; MLT=Staatliches Museum für Naturkunde Stuttgart, Museum am Löwentor, Stuttgart, Germany; UWIEN=Universität Wien, Vienna, Austria; ULg=Université de Liège, Liège, Belgium; NMW=Naturhistorisches Museum Wien, Vienna, Austria. Abbreviations under sex: f=female; m=male; u=unsexed. (Continued on the following pages.)

ID	species	sex	longitude	latitude	altitude	fossil locality
BM(NH) 39.3808	<i>A. melanoleuca</i>	m	103.75	32.25	2000	
BM(NH) 9.7.21.3	<i>A. melanoleuca</i>	u	103.75	32.25	2000	
BM(NH) 55.587	<i>A. melanoleuca</i>	u	103.75	32.25	2000	
BM(NH) 55.591	<i>A. melanoleuca</i>	u	103.75	32.25	2000	
BM(NH) 96.8.20.1	<i>A. melanoleuca</i>	u	103.75	32.25	2000	
BM(NH) 15.12.1.9	<i>H. malayanus</i>	f	98.75	14.25	150	
BM(NH) 1938.11.30.70	<i>H. malayanus</i>	f	97.75	4.75	79	
BM(NH) 1938.11.30.69	<i>H. malayanus</i>	m	97.75	4.75	79	
BM(NH) 79.11.21.198	<i>H. malayanus</i>	m	101.75	6.25	30	
BM(NH) 73.4.29.1	<i>H. malayanus</i>	u	101.75	6.25	30	

ID	species	s e x	longi- tude	lati- tude	alti- tude	fossil locality
BM(NH) 55.734	<i>H. malayanus</i>	u	112.75	2.75	600	
BM(NH) 35.1.1.4	<i>M. ursinus</i>	f	76.75	11.25	600	
BM(NH) 36.1.22.1	<i>M. ursinus</i>	f	80.25	8.25	50	
BM(NH) 36.1.22.2	<i>M. ursinus</i>	f	80.75	7.75	25	
BM(NH) 36.1.22.4	<i>M. ursinus</i>	m	80.25	9.25	70	
BM(NH) 36.1.22.6	<i>M. ursinus</i>	m	81.25	6.25	600	
BM(NH) 20.10.27.5	<i>M. ursinus</i>	m	87.25	22.25	94	
BM(NH) 20.10.27.6	<i>M. ursinus</i>	m	87.25	22.25	94	
BM(NH) 24.10.5.12	<i>M. ursinus</i>	m	85.75	22.75	400	
BM(NH) 31.1.10.8	<i>M. ursinus</i>	u	77.25	21.25	400	
BM(NH) 32.8.14.1	<i>M. ursinus</i>	u	77.75	24.75	130	
BM(NH) 220h	<i>M. ursinus</i>	u	85.25	23.75	600	
BM(NH) 24.10.5.14	<i>M. ursinus</i>	u	85.25	23.75	600	
BM(NH) 9.6.1.18	<i>M. ursinus</i>	u	76.25	12.25	790	
BM(NH) 31.1.10.9	<i>M. ursinus</i>	u	77.25	21.25	400	
BM(NH) 62.1962	<i>M. ursinus</i>	u	76.25	32.75	2190	
BM(NH) 9.7.26.1	<i>T. ornatus</i>	f	-71.25	8.75	1630	

ID	species	s e x	longi- tude	lati- tude	alti- tude	fossil locality
BM(NH) 34.9.2.70	<i>T. ornatus</i>	m	-66.25	-17.25	2540	
BM(NH) 73.6.27.4	<i>T. ornatus</i>	u	-69.75	-12.75	200	
BM(NH) 73.6.27.5	<i>T. ornatus</i>	u	-69.75	-12.75	200	
BM(NH) 1939.3617	<i>T. ornatus</i>	u	-69.75	-12.75	1500	
NMW 8271	<i>U. americanus</i>	f	-142.75	63.25	500	
NMW 8269	<i>U. americanus</i>	m	-142.75	63.25	500	
BM(NH) 61.1285	<i>U. americanus</i>	m	-149.25	61.75	1500	
BM(NH) 61.1286	<i>U. americanus</i>	m	-151.25	59.75	0	
BM(NH) 61.1287	<i>U. americanus</i>	m	-149.75	61.75	70	
BM(NH) 76.197	<i>U. americanus</i>	u	-153.75	63.75	350	
NMW 63555	<i>U. americanus</i>	u	-153.75	63.75	350	
BM(NH) 2002.124	<i>U. americanus</i>	u	-74.75	43.25	400	
BM(NH) 42.79	<i>U. americanus</i>	u	-106.25	56.25	500	
BM(NH) 12.5.15.2	<i>U. americanus</i>	u	-128.75	52.75	150	
BM(NH) 31.6.1.1	<i>U. arctos</i>	f	43.75	44.25	1200	
BM(NH) 1010g	<i>U. arctos</i>	m	39.25	34.75	500	
BM(NH) 31.2.2.1	<i>U. arctos</i>	f	75.25	34.75	4000	

ID	species	s e x	longi- tude	lati- tude	alti- tude	fossil locality
BM(NH) 32.12.15.1	<i>U. arctos</i>	f	77.25	31.75	1200	
BM(NH) 42.81	<i>U. arctos</i>	f	74.75	34.25	1800	
BM(NH) 92.10.9.1	<i>U. arctos</i>	f	91.25	29.75	4000	
BM(NH) 31.1.6.1	<i>U. arctos</i>	m	78.25	30.75	3260	
BM(NH) 32.5.6.1	<i>U. arctos</i>	m	74.75	34.25	1800	
BM(NH) 56.9.22.21	<i>U. arctos</i>	m	74.75	34.25	3000	
BM(NH) 87.5.15.2	<i>U. arctos</i>	m	74.75	34.25	3000	
BM(NH) 29.5.24.1	<i>U. arctos</i>	f	31.25	60.75	5	
BM(NH) 88.2.20.16	<i>U. arctos</i>	f	159.75	56.75	500	
BM(NH) 88.2.20.18	<i>U. arctos</i>	f	159.75	56.75	500	
BM(NH) 90.8.1.3	<i>U. arctos</i>	f	18.75	67.25	700	
BM(NH) 1991.216	<i>U. arctos</i>	f	92.25	53.25	2350	
BM(NH) 19.7.7.3610	<i>U. arctos</i>	m	31.25	60.75	5	
BM(NH) 1991.217	<i>U. arctos</i>	m	92.25	53.25	2350	
MZUF 11884	<i>U. arctos</i>	f	13.75	42.25	2000	
ZMUO 81-57	<i>U. arctos</i>	m	12.75	61.25	500	
ZMUO 348-49	<i>U. arctos</i>	m	11.75	61.75	500	

ID	species	s e x	longi- tude	lati- tude	alti- tude	fossil locality
ZMUO 11847	<i>U. arctos</i>	m	11.75	60.75	350	
MZUF 11883	<i>U. arctos</i>	m	9.75	45.25	200	
MZUF 3584	<i>U. arctos</i>	u	13.75	42.25	2000	
MZUF 7376	<i>U. arctos</i>	u	9.25	60.25	800	
MZUF 7379	<i>U. arctos</i>	u	9.25	60.25	800	
NMW 7793	<i>U. arctos</i>	u	-133.25	61.75	800	
NMW 41251	<i>U. arctos</i>	u	-159.75	63.75	300	
ZMUO 7384	<i>U. arctos</i>	u	9.25	60.25	800	
KBIN 2555-2	<i>U. arctos</i>	u	4.00	51.00	460	Belgium
AM SI-295	<i>U. deningeri</i>	u	-3.50	43.25	322	Santa Isabel Ranero
MCNB V7119	<i>U. deningeri</i>	u	-3.50	43.25	322	Santa Isabel Ranero
AM SI-1234	<i>U. deningeri</i>	u	-3.50	43.25	322	Santa Isabel Ranero
ZMUO 370-65-62	<i>U. maritimus</i>	f	5.75	58.75	0	
ZMUO 370-65-68	<i>U. maritimus</i>	f	5.75	58.75	0	
BM(NH) 41.1.19.7	<i>U. maritimus</i>	f	5.75	58.75	0	
ZMUO 370-65-66	<i>U. maritimus</i>	m	5.75	58.75	0	
BM(NH) 29.7.24.3	<i>U. maritimus</i>	u	54.75	80.75	0	

ID	species	s e x	longi- tude	lati- tude	alti- tude	fossil locality
BM(NH) 29.7.24.6	<i>U. maritimus</i>	u	54.75	80.75	0	
BM(NH) 1937.5.6.1	<i>U. maritimus</i>	u	-32.75	68.25	0	
BM(NH) 1937.5.6.3	<i>U. maritimus</i>	u	-32.75	68.25	0	
BM(NH) 1937.5.6.4	<i>U. maritimus</i>	u	-32.75	68.25	0	
BM(NH) 1937.5.6.5	<i>U. maritimus</i>	u	-32.75	68.25	0	
BM(NH) 1937.11.3.2	<i>U. maritimus</i>	u	-21.75	73.75	0	
UWIEN GS33-15	<i>U. spelaeus</i>	u	14.25	47.75	1300	Gamssulzenhöhle
UWIEN GS150-4	<i>U. spelaeus</i>	u	14.25	47.75	1300	Gamssulzenhöhle
JM 739	<i>U. spelaeus</i>	u	15.25	47.25	419	Lurgrotte
NMW MS27	<i>U. spelaeus</i>	u	16.25	47.75	441	Merkensteinhöhle
NMW MS34	<i>U. spelaeus</i>	u	16.25	47.75	441	Merkensteinhöhle
NMW MS45	<i>U. spelaeus</i>	u	16.25	47.75	441	Merkensteinhöhle
UWIEN A16	<i>U. spelaeus</i>	u	15.25	47.25	949	Mixnitz
NMW SL3	<i>U. spelaeus</i>	u	13.75	47.25	1980	Schottloch
ULg 9045	<i>U. spelaeus</i>	u	4.75	50.25	460	Belgium
NMW C1003	<i>U. spelaeus</i>	u	16.75	49.25	500	Sloup
MLT 34156.121	<i>U. spelaeus</i>	u	10.25	48.75	534	Hohlenstein

ID	species	s e x	longi- tude	lati- tude	alti- tude	fossil locality
<b>MLT 34151.597</b>	<i>U. spelaeus</i>	u	9.25	48.75	760	Sibyllenhöhle
<b>UWIEN KJ228</b>	<i>U. spelaeus</i>	u	14.25	45.75	534	Krizne
<b>BM(NH) 30.3.1.2</b>	<i>U. thibetanus</i>	f	78.25	30.25	900	
<b>BM(NH) 30.5.21.1</b>	<i>U. thibetanus</i>	f	74.25	26.25	2150	
<b>BM(NH) 95.2.21.6</b>	<i>U. thibetanus</i>	f	127.75	50.25	230	
<b>BM(NH) 26.10.8.41</b>	<i>U. thibetanus</i>	m	77.75	30.75	2750	
<b>BM(NH) 27.2.7.4</b>	<i>U. thibetanus</i>	m	75.75	34.25	3000	
<b>BM(NH) 33.2.4.3</b>	<i>U. thibetanus</i>	m	79.75	29.75	1500	
<b>BM(NH) 95.2.21.5</b>	<i>U. thibetanus</i>	m	127.75	50.25	230	
<b>BM(NH) 26.10.8.42</b>	<i>U. thibetanus</i>	u	77.75	30.75	2450	
<b>BM(NH) 80.3.20.30</b>	<i>U. thibetanus</i>	u	135.75	34.75	40	
<b>BM(NH) 219g</b>	<i>U. thibetanus</i>	u	94.75	35.25	1470	



## Mandibular Corpus Analyses *Ursus deningeri* only

Supplementary table 2.3: List of specimens used in the analyses of the general shape of the mandibles with nine landmarks and their locality. Abbreviations under ID: AM=Arkeologi Museoa, Bilbao, Spain; MCNB=Museu de Ciències Naturals de Barcelona, Barcelona, Spain; BM(NH)=Natural History Museum, London, UK; TAU=Musée de Préhistoire de Tautavel.

ID	Locality	Region
TAU 573	Caune d'Arago	France
TAU 1466	Caune d'Arago	France
BM(NH) M6186b	Bacton	British Isles
BM(NH) M6186c	Bacton	British Isles
BM(NH) M16448	Bacton	British Isles
BM(NH) M17906	Bacton	British Isles
BM(NH) M17910	Bacton	British Isles
BM(NH) M17911	Bacton	British Isles
BM(NH) M17912	Bacton	British Isles
BM(NH) M17913	Bacton	British Isles
BM(NH) M17915	Bacton	British Isles
BM(NH) M17916	Bacton	British Isles
BM(NH) 2016	Pakefield	British Isles
AM SI-295	Santa Isabel de Ranero	Iberian Peninsula
MCNB V7119	Santa Isabel de Ranero	Iberian Peninsula
AM SI-1234	Santa Isabel de Ranero	Iberian Peninsula

## Crania General Shape

Supplementary table 2.4: List of specimens used in the analyses of the general shape of the crania with eleven landmarks and their locality. *U. spelaeus* specimens are fossils. Longitude and latitude are given in degrees and altitude is given in meters above sea level. Abbreviations under ID: AM= Arkeologi Museoa, Bilbao, Spain; MZUF=Museum of Zoology and Natural History “La Specola”, Firenze, Italy; BM(NH)=Natural History Museum, London, UK; ZMUO=Natural History Museum, University of Oslo, Oslo, Norway; UWIEN=Universität Wien, Vienna, Austria; NMW=Naturhistorisches Museum Wien, Vienna, Austria; MEH= Museo de Evolución Humana, Burgos, Spain; AUTH: Geology-Paleontology Museum of the School of Geology of the Aristotle University of Thessaloniki, Thessaloniki, Greece. Abbreviations under sex: f=female; m=male; u=unsexed. (Continued on the following pages.)

ID	species	sex	locality	Longitude	latitude	altitude
BM(NH) 55.591	<i>A.melanoleuca</i>	u		103.75	32.25	2000
BM(NH) 96.8.20.1	<i>A.melanoleuca</i>	u		103.75	32.25	2000
BM(NH) 27.11.1.71	<i>T.ornatus</i>	m		-76.25	-8.25	500
BM(NH) 34.9.2.70	<i>T.ornatus</i>	m		-66.25	-17.25	2540
BM(NH) 78.8.31.12	<i>T.ornatus</i>	u		-78.25	-0.25	1900
NMW 8275	<i>U.americanus</i>	f		-150.75	61.75	65
NMW 8269	<i>U.americanus</i>	f		-142.75	63.25	500
NMW 63555	<i>U.americanus</i>	u		-154.25	63.75	300
NMW 64947	<i>U.americanus</i>	u		-141.75	64.75	800
BM(NH) 31.6.1.1	<i>U.arctos</i>	f		43.75	44.25	1200

ID	species	s e x	locality	Longi- tude	latitude	altitude
BM(NH) 1010g	<i>U.arctos</i>	m		39.25	34.75	500
BM(NH) 52.3.2.2	<i>U.arctos</i>	u		39.25	34.75	500
BM(NH) 87.5.5.3	<i>U.arctos</i>	f		74.75	34.25	3000
BM(NH) 56.9.22.21	<i>U.arctos</i>	m		74.75	34.25	3000
BM(NH) 87.5.15.2	<i>U.arctos</i>	m		74.75	34.25	3000
BM(NH) 29.5.24.1	<i>U.arctos</i>	f		31.25	60.75	5
BM(NH) 88.2.20.18	<i>U.arctos</i>	f		159.75	56.75	500
BM(NH) 90.8.1.3	<i>U.arctos</i>	f		18.75	67.25	700
BM(NH) 19.7.7.3609	<i>U.arctos</i>	m		31.25	60.75	5
MZUF 11884	<i>U.arctos</i>	f		13.75	42.25	2000
ZMUO 129-58	<i>U.arctos</i>	m		12.75	61.25	500
ZMUO 3427	<i>U.arctos</i>	m		12.75	61.25	700
ZMUO 11847	<i>U.arctos</i>	m		11.75	60.75	350
MZUF 11883	<i>U.arctos</i>	m		9.75	45.25	200
MZUF 3514	<i>U.arctos</i>	u		9.25	60.25	800
AM SI-1234	<i>U.deningeri</i>	u	S. Isabel Ranero	-3.50	43.25	322

ID	species	s e x	locality	Longi- tude	latitude	altitude
<b>MEH SH99T/U- 13/14-68</b>	<i>U.deningeri</i>	m	Sima de los Huesos, Atapuerca	-3.50	42.50	1029
<b>AUTH PEC1002</b>	<i>U.deningeri</i>	m	Petralona	23.25	40.25	316
<b>NMW MS63</b>	<i>U.spelaeus</i>	u	Merkensteinhöhle	16.25	47.75	441
<b>UWIEN 7</b>	<i>U.spelaeus</i>	u	Mixnitz	15.25	47.25	949
<b>UWIEN 43</b>	<i>U.spelaeus</i>	u	Mixnitz	15.25	47.25	949
<b>UWIEN 44</b>	<i>U.spelaeus</i>	u	Mixnitz	15.25	47.25	949
<b>BM(NH) 30.3.1.2</b>	<i>U.spelaeus</i>	u	Moravsky	16.669	49.415	500
<b>BM(NH) 30.5.21.1</b>	<i>U.spelaeus</i>	u	Sloup	16.75	49.25	500
<b>NMW A5545</b>	<i>U.spelaeus</i>	u	Sloup	16.75	49.25	500
<b>BM(NH) 30.5.21.1</b>	<i>U.thibetanus</i>	f		74.25	26.25	2150
<b>BM(NH) 31.9.21.2</b>	<i>U.thibetanus</i>	f		74.25	33.75	2440
<b>BM(NH) 95.2.21.6</b>	<i>U.thibetanus</i>	f		127.75	50.25	230
<b>BM(NH) 31.9.21.4</b>	<i>U.thibetanus</i>	m		74.25	33.75	2290
<b>BM(NH) 95.2.21.5</b>	<i>U.thibetanus</i>	m		127.75	50.25	230