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SUPPLEMENTARY ONLINE MATERIAL FOR

Shoulder height, body mass and shape of proboscideans

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Supplementary Online Material

Table 1. Estimation of body mass of different proboscideans based on allometric equations.

Table 2. Shoulder height and body mass estimations based on the extrapolation of the results obtained in the Appendix 1–6 by volumetric method and in the appendicular skeleton bone measurements.

References

Table 1. Estimation of body mass (kg) of different proboscideans based on allometric equations with low percentage prediction error (PE%<15) from bone measurements, after Christiansen (2004).
Equations are of the form log(mass in kg)= a + b(log X), where X is the bone variable (mm). %SEE and %PE are standard error of the estimate, and percentage prediction error, respectively.
Abbreviations: Diap.ap, diaphysial minimum diameter in the anteroposterior plane; Diap.lm, diaphysial minimum diameter in the lateromedial plane.

	Measurement in mm	Estimated body mass in kg	a	b	% SEE	% PE
Mammuthus meridionalis, **Scoppito**						
Humerus						
Length	1320	11959	-4.145	2.635	11.52	6.74
Diap. ap	198	12912	-0.503	2.009	5.97	3.62
Diap. lm	172	12254	-0.66	2.124	12.21	8.56
Average		**12375**				
Ulna						
Length	1200	12553	-4.135	2.674	8.41	5.34
Average		**12553**				
Femur						
Length	1455	10826	-5.568	3.036	14.54	6.15
Diap. Ap	210	29103	-0.912	2.315	16.64	11.40
Diap. lm	205	11470	-0.342	1.904	22.23	14.42
Average		**17133**				
Tibia						
Length	860	8208	-3.064	2.378	12.47	6.93
Least circumference	440	18759	-2.724	2.647	10.72	6.57
Average		**13484**				
Fibula						
Length	805	8950	-3.086	2.422	18.68	11.40
Least circumference	150	12030	-0.483	2.097	9.57	6.24
Average		**10490**				
TOTAL Average		**13207**				
Mammuthus trogontherii, **Zhalainuoer III**						
Humerus						
Length	1274	10892	-4.145	2.635	11.52	6.74
Diap. Ap	150	7392	-0.503	2.009	5.97	3.62
Diap. lm	175	12712	-0.66	2.124	12.21	8.56
Average		**10332**				
Ulna						
Length	1139	10918	-4.135	2.674	8.41	5.34
Least circumference	443	10047	-1.349	2.022	5.78	4.42
Average		**10482**				
Femur						
Length	1415	9947	-5.568	3.036	14.54	6.15
Diap. Ap	106	5978	-0.912	2.315	16.64	11.40
Diap. lm	194	10327	-0.342	1.904	22.23	14.42
Average		**8751**				
Tibia						
Length	865	8322	-3.064	2.378	12.47	6.93
Least circumference	393	13911	-2.724	2.647	10.72	6.57
Average		**11117**				
Fibula						
Length	828	9582	-3.086	2.422	18.68	11.40
Least circumference	133	9348	-0.483	2.097	9.57	6.24
Average		**9465**				
TOTAL Average		**10029**				
Mammuthus trogontherii, **Azov I**						
Humerus						
Length	1290	11257	-4.145	2.635	11.52	6.74
Diap. lm	198	16524	-0.66	2.124	12.21	8.56
Average		**13891**				
Ulna						
Length	1250	14000	-4.135	2.674	8.41	5.34
Diap. Ap	177	20292	-0.872	2.304	19.16	11.79
Average		**17147**				
Femur						
Length	1480e	11400	-5.568	3.036	14.54	6.15
Diap. lm	230	14280	-0.342	1.904	22.23	14.42
Average		**12840**				
Tibia						
Length	890	8905	-3.064	2.378	12.47	6.93
Average		**8905**				
Fibula						
Length	868	10742	-3.086	2.422	18.68	11.40
Average		**10742**				
TOTAL Average		**12705**				
Mammuthus primigenius, **Siegsdorf**						
Humerus						
Length	1100	7397	-4.145	2.635	11.52	6.74
Least circumference	450	7463	-1.598	2.062	7.78	5.54
Diap. lm	125	6221	-0.66	2.124	12.21	8.56
Average		**7027**				
Ulna						
Length	1060	9009	-4.135	2.674	8.41	5.34

Average		**9009**				
Femur						
Length	1330	8242	-5.568	3.036	14.54	6.15
Least circumference	435	7304	-1.606	2.073	18.46	11.52
Average		**7773**				
Tibia						
Length	800	6911	-3.064	2.378	12.47	6.93
Least circumference	341	9554	-2.724	2.647	10.72	6.57
Average		**8233**				
Fibula						
Length	775	8164	-3.086	2.422	18.68	11.40
Average		**8164**				
TOTAL Average		**8041**				
Mammuthus primigenius, **Rottweil**						
Humerus						
Length	805	3249	-4.145	2.635	11.52	6.74
Least circumference	350	4445	-1.598	2.062	7.78	5.54
Diap. lm	110	4742	-0.66	2.124	12.21	8.56
Average		**4145**				
Ulna						
Length	695	2914	-4.135	2.674	8.41	5.34
Average		**2914**				
Femur						
Length	945	2920	-5.568	3.036	14.54	6.15
Least circumference	323	3941	-1.606	2.073	18.46	11.52
Diap. lm	126	4541	-0.342	1.904	22.23	14.42
Average		**3801**				
Tibia						
Length	540	2714	-3.064	2.378	12.47	6.93
Least circumference	248	4113	-2.724	2.647	10.72	6.57
Average		**3413**				
Fibula						
Length	521	3120	-3.086	2.422	18.68	11.40
Least circumference	110	6278	-0.483	2.097	9.57	6.24
Average		**4699**				
TOTAL Average		**3794**				
Loxodonta africana, **Jumbo**						
Humerus						
Length	1091	7239	-4.145	2.635	11.52	6.74
Least circumference	459	7774	-1.598	2.062	7.78	5.54
Average		**7507**				
Ulna						
Length	1037	8496	-4.135	2.674	8.41	5.34
Average		**8496**				
Femur						
Length	1258	6960	-5.568	3.036	14.54	6.15
Least circumference	413	6559	-1.606	2.073	18.46	11.52
Average		**6760**				
Tibia						
Length	788	6667	-3.064	2.378	12.47	6.93
Average		**6667**				
Fibula						
Length	764	7886	-3.086	2.422	18.68	11.40
Average		**7886**				
TOTAL Average		**7640**				
Stegodon zdasnkyi, **Yellow river**						
Humerus						
Length	1210	9509	-4.145	2.635	11.52	6.74
Least circumference	590	13047	-1.598	2.062	7.78	5.54
Average		**11278**				
Ulna						
Length	1100	9947	-4.135	2.674	8.41	5.34
Circumference	470	11324	-1.349	2.022	5.78	4.42
Average		**10636**				
Femur						
Length	1460	10939	-5.568	3.036	14.54	6.15
Least circumference	560	12331	-1.606	2.073	18.46	11.52
Diap. Ap	133	10109	-0.912	2.315	16.64	11.40
Diap. lm	193	10226	-0.342	1.904	22.23	14.42
Average		**10901**				
Tibia						
Length	909	9364	-3.064	2.378	12.47	6.93
Circumference	440	19759	-2.724	2.647	10.72	6.57
Average		**14062**				
Fibula						
Length	877	11014	-3.086	2.422	18.68	11.40
Least circumference	180	17632	-0.483	2.097	9.57	6.24
Average		**14323**				
TOTAL Average		**12240**				
Mammut americanum, **K, Kolarik**						
Humerus						
Length	866	3939	-4.145	2.635	11.52	6.74
Circumference	396	5734	-1.598	2.062	7.78	5.54
Average		**4837**				
Ulna						
Length	737	3409	-4.135	2.674	8.41	5.34

Least circumference	340	5884	-1.349	2.022	5.78	4.42
Average		**4647**				
Femur						
Length	1079	4368	-5.568	3.036	14.54	6.15
Circumference	383	5610	-1.606	2.073	18.46	11.52
Diap. Ap	90	4093	-0.912	2.315	16.64	11.40
Diap. lm	146	6011	-0.342	1.904	22.23	14.42
Average		**5021**				
Tibia						
Length	626	3857	-3.064	2.378	12.47	6.93
Least circumference	300	6807	-2.724	2.647	10.72	6.57
Average		**5332**				
Fibula						
Length	595	4304	-3.086	2.422	18.68	11.40
Average		**4304**				
TOTAL Average		**4828**				
Mammuthus exilis, **Santa Rosa 1994**						
Humerus						
Length	651	1857	-4.145	2.635	11.52	6.74
Diap. lm	68	1707	-0.66	2.124	12.21	8.56
Average		**1782**				
Ulna						
Length	600	1967	-4.135	2.674	8.41	5.34
Average		**1967**				
Femur						
Length	800	1761	-5.568	3.036	14.54	6.15
Diap. lm	79	1867	-0.342	1.904	22.23	14.42
Average		**1814**				
Tibia						
Length	423	1519	-3.064	2.378	12.47	6.93
Average		**1519**				
Fibula						
Length	388	1528	-3.086	2.422	18.68	11.40
Average		**1528**				
TOTAL Average		**1722**				
Loxodonta africana, **NMNS002990 – F002715**						
Humerus						
Length	846	3704	-4.145	2.635	11.52	6.74
Average		**3704**				
Ulna						
Length	750	3572	-4.135	2.674	8.41	5.34
Least circumference	265	3555	-1.349	2.022	5.78	4.42
Diap. Ap	69	2316	-0.872	2.304	19.16	11.79
Average		**3148**				
Femur						
Length	980	3261	-5.568	3.036	14.54	6.15
Least circumference	305	3499	-1.606	2.073	18.46	11.52
Average		**3380**				
Tibia						
Length	585	3283	-3.064	2.378	12.47	6.93
Least circumference	232	3447	-2.724	2.647	10.72	6.57
Average		**3365**				
Fibula						
Length	576	3979	-3.086	2.422	18.68	11.40
Least circumference	83	3478	-0.483	2.097	9.57	6.24
Average		**3728**				
TOTAL Average		**3465**				
Gomphotherium steinheimense, **Mühldorf**						
Humerus						
Length	1010	5907	-4.145	2.635	11.52	6.74
Least circumference	520	10055	-1.598	2.062	7.78	5.54
Diap. lm	144	8402	-0.66	2.124	12.21	8.56
Average		**8121**				
Ulna						
Length	930	6349	-4.135	2.674	8.41	5.34
Least circumference	350	6239	-1.349	2.022	5.78	4.42
Diap. Ap	91	4382	-0.872	2.304	19.16	11.79
Average		**5657**				
Femur						
Length	1230	6501	-5.568	3.036	14.54	6.15
Least circumference	440	7480	-1.606	2.073	18.46	11.52
Diap. Ap	104	5720	-0.912	2.315	16.64	11.40
Diap. lm	164	7500	-0.342	1.904	22.23	14.42
Average		**6800**				
Tibia						
Length	775	6409	-3.064	2.378	12.47	6.93
Least circumference	339	9407	-2.724	2.647	10.72	6.57
Average		**7908**				
Fibula						
Length	735	7180	-3.086	2.422	18.68	11.40
Least circumference	120	7534	-0.483	2.097	9.57	6.24
Average		**7357**				
TOTAL Average		**7169**				
Palaeoloxodon antiquus, **Konin**						
Humerus						
Length	1287	11188	-4.145	2.635	11.52	6.74

Diap. Ap	166	9061	-0.66	2.124	12.21	8.56
Average		**10125**				
Ulna						
Length	1083	9541	-4.135	2.674	8.41	5.34
Diap. Ap	144	12614	-0.872	2.304	19.16	11.79
Average		**11078**				
Femur						
Length	1429	10249	-5.568	3.036	14.54	6.15
Diap. Ap	130	9589	-0.912	2.315	16.64	11.40
Diap. lm	157	6902	-0.342	1.904	22.23	14.42
Lat.con.w	143	19707	-1.514	2.695	13.21	9.91
Average		**11612**				
Tibia						
Length	880	8669	-3.064	2.378	12.47	6.93
Least circumference	435	18200	-2.724	2.647	10.72	6.57
Average		**13435**				
Fibula						
Length	871	10832	-3.086	2.422	18.68	11.40
Circumference	190	19749	-0.483	2.097	9.57	6.24
Average		**15291**				
TOTAL Average		**12308**				

Table 2. Shoulder height and body mass estimations based on the extrapolation of the results obtained in the Appendix and appendicular skeleton bone measurements.

e Estimated, error margin of about ±2% in shoulder height
~ Around, error margin of about ±5% in shoulder height and ±20% in body mass
+ Over
() Estimated size including the epyphysis

Species	Locality/Specimen Nº	Gender	Age	Scapula max. length	Scapula art. length	Humerus max. length	Humerus. art. length	Ulna max. length	Ulna art. length	Radius length	Femur length	Tibia length	Fibula	Pelvis breadth	Skeletal SH	SH in the flesh	Body Mass	Bone measurement References
Deinotherium																		
D. giganteum	Cecerinos de Campos	-	-	-	960	-	980	-	830	880	1200	850	805	-	320	**338**	**+6**	Bergounioux and Crouzel 1962
D. giganteum	Kettlasbrunn	♂	-	-	-	-	-	1178	-	-	-	-	-	1880	~370	**~390**	**~11**	Bachmayer and Zapfe 1976
D. giganteum	Breitenfeld	-	-	-	-	-	-	-	-	-	-	-	-	1800		**~375**	**~9.5**	Mottl 1969
D. giganteum	Pikermi	-	-	-	-	-		-	-	920	-	950	870	-		**~370**	**~9**	Kovachev and Nikolov 2006; Gaudry 1862
D. levius	Gussiatin	-	-	1030	960e	1095	1070	1040	890	965	-	-	-	-	341	**360**	**~8.3**	Svistun 1974
D. proavum	Pripicenii Răzeşi	♂	-	1050	980	-	1100	-	960	-	1450	995	-		353	**372**	**~10.5**	Odava personal communication 2012
D. proavum	Codreanca	♂	-	-	-	-	1150	-	-	-	1420	930	-	-	355e	**375e**	**~11**	David and Shushpanov 1972
D. proavum	Obukhovka	♂	-	-	+700	1100	1065	1080	-	950	1450	965	900	1930	340	**359**	**10.5**	Vadim Titov personal communication 2014
Mammut																		
M. borsoni	Autrey	-	-	-		-		-	-	-	1330	-	-	-		**~360**	**~11**	Tsoukala 2000
M.borsoni	Milia II	♀	-	-	-	1080	1060	-	-	-	-	-	-	-	315e	**332e**	**~8.5**	Dick Mol pers. commnucation 2013
M. americanum	USNM 8204	-	~35	-	920	-	905	795	655	775	1050	660	-	1800	269	**284**	**7.6**	Gidley 1926
M. americanum	Conway	♂		-	840	-	940	785	-	-	1105	710	-	1830	265	**280**	**7.8**	Gnidovec and Glotzhober personal communication 2011
M. americanum	Watkins Glen	♂	35	(850)	-	937	916	782	635	690	1075	662	621	1750e	258	**272**	**7**	Hodgson et al. 2008
M. americanum	44BS71	♂	-	-	-	-	1001	-	-	-	-	-	-	-	-	**300e**	**~9**	Saunders 1977
M. americanum	K, Kolarik	-	~40	897	864	866	-	737	-	651	1079	626	595	-	255	**269**	**~6.5**	Richards 1984
M. americanum	FMNH P3945	♂	-	-	-	924	-	803	-	-	1124	731	-	-	265e	**280e**	**~7.5**	Christiansen 2004
Gomphotherium																		
G. osborni	After Barbour 1917	-	-	-	660	-	660	610	-	559	762	-	-	1525	205	**216**	**3.3**	Osborn 1942
G. angustidens	Paris	-	-	-	-	678	-	649	-	588	894	576	-	-	210e	**222e**	**~3.1**	Christiansen 2004
Amebelodon																		
A. britti	UF 69997	♂	-	-	836	-	-	890	-	800	1297	744	679	-	295e	**311e**	**~8**	Lambert 1990
Eubelodon																		
E. morrilli	UNSM 1416	-	-	-	760e	-	760	685	-	610	940e	560	545	1424	234	**247**	**+4**	Osborn 1942
E. morrilli	AMNH 25708	-	-	-	880	-	910	-	660	-	1080	-	-	-	270e	**285e**	**~6**	Osborn 1942
Notiomastodon																		
N. platensis	AMNH 11198	-	-	-	-	863	-	-	-	-	963	-	-	-	245e	**258e**	**~4.5**	Christiansen 2004
N. platensis	MPG-PD-001	-	-	-	835	945	922	822	670	710	1095	693	652	-	270	**285**	**6.5**	Lucas et al. 2011
Tetralophodon																		
T. longirostris	Villa Vieja del Cerro	♂	45	1050		-		-	-	-	-	-	-	-	-	**~345**	**~10**	Mazo and Jordá 1997
T. longirostris	Polinya	♀?	-	-	-	-	770	820	-	700	950	600	610	-	250	**264**	**+4**	Alberdi 1971
T. longirostris	Breitenfield	♂?	-	-	(900)	-	910	883	-	810	1140e		-	-	293	**309**	**~7**	Mottl 1969
Stegotetrabelodon																		
S. orbus	KNM LT-369	-	-	-	-	-	960	-	-	-	-	-	-	-	-	**300e**	**~6**	Maglio and Ricca 1977
Primelephas																		
P. Gomphotheroides	KNM LT-370	-	-	-	-	-	-	-	-	-	1211	-	-	-	-	**~320**	**~6.5**	Maglio and Ricca 1977
Palaeoloxodon																		
P. recki	Serengetisteppe	-	-	-	-	-	-	1070	-	980	1470	-	-	(1650)	370e	**390e**	**9.8**	Dietrich 1924
P. recki	Serengetisteppe	-	-	-	-	-	1235	-	-	-	-	-	-	-	365e	**385e**	**~9**	Dietrich 1916
P. antiquus	Upnor	♂	35	-	1170	-	1290	-	-	990	1500e	1020	930	~1950	383	**404**	**~13**	Andrews and Cooper 1928
P. antiquus	Pignataro	♂	40	-	1065	-		-	-	-	-	-	-	-	365e	**385e**	**~11**	Osborn 1942
P. antiquus	Taubach	♂	-	-	-	-	1300	-	-	-	1500	900	-	-	385e	**406**	**~13**	Osborn 1942
P. antiquus	Konin	♂	50	1146	-	1287	-	1083	930	1002	1429	+880	871	-	370	**390**	**~11.5**	Jakubowski 1988,1996
P. antiquus	Gröben	♂	-	1075	-	1320	1265	1100	915	967	1402	915	860	-	362	**382**	**+11**	Jakubowski 1996
P. antiquus	Warsaw	♂	-	+1050		1162	1128	-	-	-	-	-	-	-	335e	**353e**	**~8.5**	Jakubowski 1996
P. antiquus	Grabschütz	♀?	-	+811	-	990	950	865	722	765	1130?	666	637	-	280	**295**	**~5.5**	Jakubowski 1996
P. antiquus	Il Crocifisso	♀?	25	-	(880)	1150	-	950	-	820	1290e	744	715	-	313	**330**	**~8**	Maccagno 1962
P. antiquus	Rocasecca	♂	-	-		-	1250	-	-	-	-	-	-	-	370e	**390e**	**~12**	Trevisan 1949
P. antiquus	Binsfeld	♀	-	-		-		-	-	-	-	-	-	1580	-	**~335**	**~7.5**	Göhlich 2000
Mammuthus																		
M. meridionalis	Edersleben	♀	40	-	897	-	1066	-	802	842	1277e	658	659e	1540	312	**329**	**7**	Bajgusheva & Garutt 1987; Lister 1996

M. meridionalis	Nogaisk	♂	45	-	1155	1292	1270	1100	970	1040	1460	980e	901e	1670	385	**406**	**10.4**	Azzaroli 1977; Maschenko et al. 2011
M. meridionalis	Georgievsk	♂	40	-	1040	-	1225	1100	885	945	1435	820	820	1680	355	**375**	**9.3**	Azzaroli 1977; Maschenko et al. 2011
M. meridionalis	Dufort	♂♂	35	-	-	1255	1220	1080	-	869	1360	820	-	-	350e	**369e**	**~8.8**	Osborn 1942; Chrisitansen 2004
M. meridionalis	Farneta / IGF 14838)	♂♂	40	-		-	1270	1083	990	945	1460	815	820	-	375e	**396**	**~10.5**	Azzaroli 1977; Lister 2010
M. meridionalis	Savignano	-	55	-	810	1070	1050	-	-	760	1240	720	680	-	301	**318**	**~6**	
M. meridionalis	Borro al Querco / IGF 10791	♂♂	50	-	-	-	1100	-	930	-	1380	810	-	1460	335e	**353**	**7.5**	Azzaroli 1977
M. meridionalis	Paris Forelimb	♂♂♂	-	-	-	1287		1160	-	1042	-	-	-	-	380e	**401**	**~11**	Christiansen 2004
M. meridionalis	Rodionovo	♂♂	40	-	1103	1260	-	1075	910	945	1440	850	823	1620	364	**384**	**9.8**	Maschenko et al. 2011
M. meridionalis	Ceyssaguet	♂♂♂	-	-	-	-	-	-	-	-	-	915	-	-	-	**~415**	**~12**	Aouadi 2001
M. meridionalis	IGF 1057	♂♂	-	-	-	-	-	-	-	-	-	-	-	1780	-	**~400**	**~11**	Lister 1996
M. trogontherii	West Runton	♂	42	-	(1090)	1240	1230	1080	920	897	1425	830	790	1760	363	**383**	**10.3**	Lister 2010
M. trogontherii	Azov I	♂	41	-	1100e	-	1290	1250	950	-	1480e	900	868	1830e	375e	**396e**	**11.6**	Bajgusheva & Garutt 2011
M. trogontherii	Irtysh I	♂♂	30	(870)	(810)	1010	970	-	-	-	1230	645	-	-	290e	**306e**	**~5.5**	Kosintsev et al. 2004
M. trogontherii	Irtysh II	♂♂	58	-	1130	-	1320	1130	940	965	1500		-	~1700	382	**403**	**11.5**	Shpansky et al 2008a
M. trogontherii	Kostolac	♂♂	64	1100	-	1215	1170	1080	875	925	1470	855	765	1670	351	**370**	**9.5**	Lister 2012
M. trogontherii	Odessa	♂	-	-		-	1230	1030	980	1030	1480	920	895	-	370e	**390e**	**~11**	Shpansky et al 2008b
M. trogontherii	Novogeorgievsk,	♂♀	36	-	860	-	980	850	-	770	1210	690	-	-	290	**306**	**~5**	Kosintsev et al. 2004; Zakrevska 1935
M. trogontherii	Gelsenkirchen	♂	36	-		1190		950	-	-	1300	760	-	-	345e	**364e**	**+7.5**	Siegfried 1956
M. trogontherii	Azov II	♂♀	49	1070	1045	1200	1160	1020	880	955	1400	800	750	1820	349	**368**	**9.6**	Bajgusheva & Garutt 2011
M. trogontherii	Edersleben	♂♀	-	-	-	-	1246	-	-	-	-	-	-	-	365e	**385e**	**~10.5**	Shpansky et al 2008b
M. trogontherii	Budapest	-	-	-		-	-	-	-	-	1430	-	-	-	370e	**390**	**~10.5**	Osborn 1942
M. trogontherii	Codreni	♂	-	-	-	1220	1200	1080	-	1000e	1400	850	-	+1660	370e	**390**	**10**	Apostol 1971
M. trogontherii	Loussiká	♂	43	1070	1045	-	-	975	825	-	-	750	-	-	~335	**~353**	**~8**	Athanassiou, 2011
M. trogontherii	Flaminia	♂	-	-	1300e	-	-				1430			+1700	370e	**390e**	**10.2**	Kotsakis et al. 1978
M. columbi	"Archie"	♂♂	+50	-	+1066	-	1251	1084	-	-	-	-	-	-	370e	**390e**	**~10.2**	Osborn 1942;
M. columbi	AMNH 9950	♂♂	+50	-	900	-	1120	-	-	-	1255	690	-	1450	324e	**342e**	**6.8**	Osborn 1942
M. columbi	AMNH 26820A	♂♂	-	-	-	1177	1143	869	-	-	1236	729	-	-	335e	**353e**	**~7**	Osborn 1942; Christiansen 2004
M. columbi	AMNH 10598	♂♂	-	-	1017	1205	1095	1082	-	958	-	-	-	-	344	**363**	**~8.5**	Osborn 1942; Christiansen 2004
M. columbi	AMNH 26821A	♂♂	-	-		1192	1185	-	-	-	1399	-	-	-	350e	**369e**	**~9**	Osborn 1942; Christiansen 2004
M. columbi	Brevard	♂♂	-	-	1037	-	1030	1060	-	952	1340	825	825	-	339	**358**	**~8.5**	Osborn 1942
M. columbi	NMC 17914	♂	-	(970)	(920)	1133	1120	-	-	-	1330	740	-	-	330e	**348e**	**~7.5**	Harington et al. 1974
M. columbi	Reynolds	♂	-	-	-	-	-	-	-	-	1422	-	-	-	370e	**390e**	**~10.2**	Osborn 1942
M. columbi	Napoleon	♂	49	1015	-	1223	-	1086	-	948	1326	813	786	1748e	348	**367**	**9**	Agenbroad and Mead, 1994; Agenbroad personal comunication 2014
M. columbi	Fort Robinson	♂♂	50	1047	-	1109	-	946	-	823	1281	728	-	-	320	**338**	**~7**	Agenbroad and Mead, 1994
M. columbi	Lange-Ferguson	♂	38	+977	-	1261	-	1014	-	928	1372	842	815	-	355	**375**	**~9.5**	Agenbroad and Mead, 1994
M. columbi	83-HS-187	♂	-	1042	-	1268	-	-	-	-	1400	823	784	1529	355e	**375e**	**9**	Agenbroad and Mead, 1994; Agenbroad personal comunication 2014
M. columbi	83-187/069	♂	-	-	-	1288	1276	-	-	-	-	-	-	-	370e	**390e**	**~10**	Agenbroad 1994
M. primigenius	Lena ("Adams")	♂	45	910	880	1000	995	-	770	820	1200	675	660	1370	298	**314**	**5.8**	Garutt 1964; Siegfried 1956; Averianov 1996
M. primigenius	Tura	♂	39	-	-	-	1040	-	760	-	1294	670	-	-	300e	**317**	**+6**	Garutt 1964
M. primigenius	Vilnius	-	-	-	-	940		-	720	720	1170	640	659	-	277	**292**	**~5.2**	Garutt 1964
M. primigenius	Mochovoi	♂	43	-	-	1020	974	-	-	-	1230e	700	630	-	300e	**317**	**~6**	Lister 2010
M. primigenius	Avanskaya	♂	-	-		1000		840	-	740	-	670	-	-	285e	**301**	**+5**	Felix 1912; Lister 2010
M. primigenius	Borna	♂	50	-	870	1080	-	895	-	790	1150	680	680	-	304	**321**	**~6**	Garutt 1964;Felix 1912
M. primigenius	Pfannerhall	♂♂	40	-	795 (880)	1040	-	900	-	825	1220	678	634	-	304	**321**	**+6**	Garutt 1964
M. primigenius	Ahlen	♂♂	32	880		1030		870	-	793	1240	680	663	1370	298	**314**	**5.9**	Siegfried 1956
M. primigenius	Matraderecske	♂♂	38	-		960		845	-	780	1215	640	-	-	283e	**299**	**~5.5**	Vörös, 1975; Lister 2010
M. primigenius	Condover	♂♂	28	-	(770)850e	-	1000	834	720	750	1190	685	-	1430	289	**305**	**5.8**	Lister
M. primigenius	Praz Rodet	♂♂	41	-	840	950e		-	670	700	1160	660	600	-	273	**288**	**~5**	Weidmann 1969;Lister 2010
M. primigenius	Baulou	♂	-	-		-		-	-	760	1170	-	-	-	~285	**301**	**+5**	Astre 1929
M. primigenius	Atrikanova	♂	39	-		878		-	-	-	1050	-	-	-	260e	**274**	**~4**	Lister 2010

M. primigenius	Oyosh	♀♀♂♂	-	-	635	-	770	-	575	592	945	536	535	1170	223e	**235**	**3**	Bajgusheva & Garutt 1987
M. primigenius	Aa	♀♀♂♂	40	-	+710	-	840	770	-	670	1100	640	-	1340	248e	**262**	**4.2**	Pontier 1913;Lister 2010
M. primigenius	Sanga-Jurjach	♀♀♂♂	60	-		750	726	-	563	593	915	-	-	-	220e	**232**	**~2.8**	Averianov 1996;Lister 2010
M. primigenius	Rottweil	♀♀♂♂	35	650		805		695	-	-	945	540	521	-	224e	**236**	**~3**	Ziegler 2001
M. primigenius	Sevsk	♀♀♂♂	50	-		825		-	-	-	965	-	-	-	245e	**258**	**~3.3**	Lister 2010
M. primigenius	Hebior	♂♂	-	-		1037		860	-	775	1203	682	623	-	295e	**311**	**~5.8**	Christiansen 2004
M. primigenius	Kastykhtakh	♀♀♂♂	35	660	637	731	717	618	551	565	880	501	491	1160	215	**227**	**2.8**	Kirillova et al 2012
M. primigenius	Heilongjiang	♀♀♂♂	40	-		1092		823	810	-	-	-	-	1500	312e	**329**	**~6.8**	Zhen et al 1979
M. primigenius	Băneasa	♂♂	-	-	-	-	-	-	-	-	1360	-	-	-	~330	**350**	**~8**	Apostol 1976
M. primigenius fraasi	Steinheim	♂♂	45	-	1090	1270	-	1075	-	955	1420	820	820	(1500)	369	**389**	**9.5**	Dietrich 1912
M. primigenius	Yukagir	♂♂	-	794		890		-	-	-	-	-	-	-	260e	**274**	**+4**	Mol et al 2006
M. primigenius	Kemel	♂♂	-	-	750	-	910	-	666	-	1050	580	590	-	263	**277**	**+4**	Garutt 1964
M. primigenius	Kozlovo	♂♂	-	-	780	-	810		660	-	1050	582	-	-	254	**268**	**~4**	Kosintsev 2004;Lister 2010
M. primigenius	Beresovka	♂♂	45	-	759	870	840	717	672	702	1030	626	591	1340	257	**271**	**4.2**	Garutt 1964; Siegfried 1956; Averianov 1996
M. primigenius	Fishook	♂♂	55	820	-	890	-	790	-	-	-	600	560	-	262e	**276**	**+4**	Mol et al 2006
M. primigenius	Gydan	♂♂	45	-	860	1010		860	-	800	1150	695	-	1300	297	**313**	**5.3**	Lister 2010
M. primigenius	Khatanga	♂♂	39	+820		1030e		820	-	730	1170	660	-	-	288e	**304**	**+5**	Lister 2010

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