

Supplementary Information for

Gregariousness in the giant sloth *Lestodon* (*Xenarthra*): multi-proxy approach of a bonebed from the Last Maximum Glacial of Argentine Pampas

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Table S1. Mammals from Late Pleistocene levels of Playa del Barco site and their estimated body mass (EBM).

Taxa	EBM (kg)
Order Folivora	
Family Megatheriidae	
<i>Megatherium americanum</i>	~6,070 ^{1,3,5}
Family Mylodontidae	
<i>Lestodon armatus</i>	~3,400-4,100 ^{1,2,5}
<i>Glossotherium robustum</i>	~1,500-1,700 ^{1,2,3,5}
<i>Scelidotherium leptocephalum</i>	~850-1,050 ^{1,2,3,5}
Order Cingulata	
Family Glyptodontidae	
<i>Glyptodon clavipes</i>	~2,000 ^{3,5}
<i>Glyptodon reticulatus</i>	~410-860 ^{1,3,4,5}
<i>Doedicurus clavicaudatus</i>	~1,470-1,760 ^{1,3,5}
<i>Panochthus</i> sp.	~1,050-1,330 ^{1,3,4,5}
Order Notoungulata	
Family Toxodontidae	
<i>Toxodon platensis</i>	~1,640 ^{1,3,5}
Order Litopterna	
Family Macraucheniiidae	
<i>Macrauchenia patachonica</i>	~1,000 ^{1,3,5}
Order Proboscidea	
Family Gomphotheriidae	
<i>Stegomastodon platensis</i>	~7,500-7,600 ^{3,5}
Order Artiodactyla	
Family Cervidae	
<i>Morenelaphus</i> sp.	~50 ^{3,5}
Order Perissodactyla	
Family Equidae	
<i>Hippidion</i> sp.	~500 ^{1,3}
<i>Equus (Amerhippus) neogeus</i>	~300 ^{3,5}
Order Carnivora	
Family Felidae	
<i>Smilodon populator</i>	~300-400 ^{3,5}

References

1. Fariña, R. A., Vizcaíno, S. F., Bargo, M. S. Body mass estimations in Lujanian (Late Pleistocene-Early Holocene of South America) mammal megafauna. *Mastozoología Neotropical* **5**, 87–108 (1998).

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3. Prevosti, F. J., Vizcaíno, S. F. Paleoecology of the large carnivore guild from the late Pleistocene of Argentina. *Acta Palaeontol. Polonica* **51**, 407–422 (2006).
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Table S2. Summary of stable isotope dataset from Playa del Barco. Taxa, number of carbonate samples (# C), mean and standard deviation (SD) $\delta^{13}\text{C}$ (‰ VPDB), $\delta^{18}\text{O}_{\text{CO}_3}$ (‰ VSMOW), number of phosphate samples (# P), mean and standard deviation (SD) $\delta^{18}\text{O}_{\text{PO}_4}$ (‰ VSMOW), and difference between $\delta^{18}\text{O}_{\text{CO}_3}$ and $\delta^{18}\text{O}_{\text{PO}_4}$ values ($\Delta \delta^{18}\text{O}_{\text{CO}_3} - \delta^{18}\text{O}_{\text{PO}_4}$).

Taxa	# C	Mean $\delta^{13}\text{C}$	SD $\delta^{13}\text{C}$	Mean $\delta^{18}\text{O}_{\text{CO}_3}$	SD $\delta^{18}\text{O}_{\text{CO}_3}$	# P	Mean $\delta^{18}\text{O}_{\text{PO}_4}$	SD $\delta^{18}\text{O}_{\text{PO}_4}$	$\Delta \delta^{18}\text{O}_{\text{CO}_3} - \delta^{18}\text{O}_{\text{PO}_4}$
		(‰ VPDB)	(‰ VPDB)	(‰ VSMOW)	(‰ VSMOW)		(‰ VSMOW)	(‰ VSMOW)	
All taxa	36	-6.3	2.6	28.6	0.9	23	19.7	1.2	8.9
<i>Lestodon armatus</i>	6	-3.8	1.6	27.9	0.5	5	18.8	0.6	9.1
<i>Megatherium americanum</i>	2	-7.1	0.1	28.2	0.1	2	18.7	0.1	9.5
<i>Scelidotherium leptcephalum</i>	1	-3.9	-	26.8	-	1	18.0	-	8.8
<i>Toxodon platensis</i>	9	-5.1	1.7	28.2	0.9	6	19.8	1.1	8.4
<i>Stegomastodon platensis</i>	5	-6.3	2.1	29.1	1.0	4	20.7	1.2	8.4
<i>Equus (Amerhippus) neogeus</i>	1	-6.7	-	29.1	-				
<i>Morenelaphus</i> sp.	7	-10.2	0.8	29.3	0.4	5	20.7	0.8	8.6
<i>Smilodon populator</i>	5	-7.9	0.6	29.2	0.5				

Table S3. ANOVA and Tukey post-hoc tests for $\delta^{13}\text{C}$ (‰ VPDB), $\delta^{18}\text{O}_{\text{CO}_3}$ (‰ VSMOW) and $\delta^{18}\text{O}_{\text{PO}_4}$ (‰ VSMOW) values among mammalian species from Playa del Barco.

$\delta^{13}\text{C}$ (‰ VPDB) (F = 16.348; p < 0.001)	<i>Toxodon platensis</i>	<i>Megatherium americanum</i>	<i>Lestodon armatus</i>	<i>Stegomastodon platensis</i>	<i>Morenelaphus</i> sp.	<i>Smilodon populator</i>
<i>Toxodon platensis</i>	-					
<i>Megatherium americanum</i>	0.455	-				
<i>Lestodon armatus</i>	0.569	0.081	-			
<i>Stegomastodon platensis</i>	0.672	0.976	0.084	-		
<i>Morenelaphus</i> sp.	< 0.001	0.115	< 0.001	0.001	-	
<i>Smilodon populator</i>	0.016	0.987	0.001	0.474	0.100	-

$\delta^{18}\text{O}_{\text{CO}_3}$ (‰ VSMOW) (F = 4.594; p = 0.003)	<i>Toxodon platensis</i>	<i>Megatherium americanum</i>	<i>Lestodon armatus</i>	<i>Stegomastodon platensis</i>	<i>Morenelaphus</i> sp.	<i>Smilodon populator</i>
<i>Toxodon platensis</i>	-					
<i>Megatherium americanum</i>	1.000	-				
<i>Lestodon armatus</i>	0.941	0.995	-			
<i>Stegomastodon platensis</i>	0.277	0.654	0.087	-		
<i>Morenelaphus</i> sp.	0.051	0.375	0.013	0.994	-	
<i>Smilodon populator</i>	0.119	0.463	0.034	0.998	1.000	-

$\delta^{18}\text{O}_{\text{PO}_4}$ (‰ VSMOW) (F = 4.346; p = 0.013)	<i>Toxodon platensis</i>	<i>Megatherium americanum</i>	<i>Lestodon armatus</i>	<i>Stegomastodon platensis</i>	<i>Morenelaphus</i> sp.
<i>Toxodon platensis</i>	-				
<i>Megatherium americanum</i>	0.651	-			
<i>Lestodon armatus</i>	0.449	1.000	-		
<i>Stegomastodon platensis</i>	0.560	0.153	0.052	-	
<i>Morenelaphus</i> sp.	0.424	0.111	0.028	1.000	-

Table S4. Stable isotope total dataset from Playa del Barco. Collection number, order, family, genus/species, analyzed tissue, $\delta^{13}\text{C}$ (‰ VPDB), $\delta^{18}\text{O}_{\text{CO}_3}$ (‰ VPDB), $\delta^{18}\text{O}_{\text{CO}_3}$ (‰ VSMOW), $\delta^{18}\text{O}_{\text{PO}_4}$ (‰ VSMOW), and difference between $\delta^{18}\text{O}_{\text{CO}_3}$ and $\delta^{18}\text{O}_{\text{PO}_4}$ values ($\Delta \delta^{18}\text{O}_{\text{CO}_3} - \delta^{18}\text{O}^{\text{PO}_4}$).

Collection number	Order	Family	Genus/Species	Analyzed tissue	$\delta^{13}\text{C}$ (‰ VPDB)	$\delta^{18}\text{O}_{\text{CO}_3}$ (‰ VPDB)	$\delta^{18}\text{O}_{\text{CO}_3}$ (‰ VSMOW)	$\delta^{18}\text{O}_{\text{PO}_4}$ (‰ VSMOW)	$\Delta \delta^{18}\text{O}_{\text{CO}_3} - \delta^{18}\text{O}^{\text{PO}_4}$
MD-PDB-85-42	Notoungulata	Toxodontidae	<i>Toxodon platensis</i>	Tooth enamel	-7.0	-1.9	28.9		
MD-PDB-85-134	Notoungulata	Toxodontidae	<i>Toxodon platensis</i>	Tooth enamel	-5.5	-2.4	28.4		
MD-PDB-85-41	Notoungulata	Toxodontidae	<i>Toxodon platensis</i>	Tooth enamel	-2.5	-2.6	28.2	20.0	8.2
Without signature	Notoungulata	Toxodontidae	<i>Toxodon platensis</i>	Tooth enamel	-4.8	-2.8	28.0	19.8	8.2
MD-PDB-85-279	Notoungulata	Toxodontidae	<i>Toxodon platensis</i>	Tooth enamel	-4.8	-1.6	29.3	21.2	8.0
MD-PDB-90-26	Notoungulata	Toxodontidae	<i>Toxodon platensis</i>	Tooth enamel	-6.9	-3.1	27.7	20.0	7.7
MD-PDB-97-13	Notoungulata	Toxodontidae	<i>Toxodon platensis</i>	Tooth enamel	-2.4	-2.8	28.0	19.6	8.4
MD-PDB-7002	Notoungulata	Toxodontidae	<i>Toxodon platensis</i>	Tooth enamel	-6.4	-4.3	26.4	18.0	8.5
MD-PDB-7001	Notoungulata	Toxodontidae	<i>Toxodon platensis</i>	Tooth enamel	-5.1	-1.7	29.1		
MD-PDB-97-1-1	Folivora	Mylodontidae	<i>Scelidothorium leptocephalum</i>	Orthodentine	-3.9	-4.0	26.8	18.0	8.8
MD-PDB-90-30	Folivora	Megatheriidae	<i>Megatherium americanum</i>	Orthodentine	-7.0	-2.7	28.1	18.7	9.4
MD-PDB-05-192	Folivora	Megatheriidae	<i>Megatherium americanum</i>	Orthodentine	-7.2	-2.5	28.3	18.8	9.5
MD-PDB-99-63-2	Folivora	Mylodontidae	<i>Lestodon armatus</i>	Orthodentine	-2.3	-2.4	28.4	19.6	8.8
MD-PDB-29-90-1	Folivora	Mylodontidae	<i>Lestodon armatus</i>	Orthodentine	-4.7	-2.6	28.2	18.9	9.3
MD-PDB-29-90-2	Folivora	Mylodontidae	<i>Lestodon armatus</i>	Orthodentine	-3.7	-3.3	27.5		
MD-PDB-85-75	Folivora	Mylodontidae	<i>Lestodon armatus</i>	Orthodentine	-6.5	-3.2	27.6	18.5	9.2
MD-PDB-05-113	Folivora	Mylodontidae	<i>Lestodon armatus</i>	Orthodentine	-3.3	-3.4	27.4	18.0	9.4
MD-PDB-00-8	Folivora	Mylodontidae	<i>Lestodon armatus</i>	Orthodentine	-2.2	-2.5	28.3	19.0	9.3
MD-PDB-85-274	Proboscidea	Gomphoteriidae	<i>Stegomastodon platensis</i>	Tooth enamel	-7.4	-0.5	30.4	21.9	8.5
MD-PDB-85-261	Proboscidea	Gomphoteriidae	<i>Stegomastodon platensis</i>	Tooth enamel	-8.4	-1.4	29.5	20.5	9.0
MD-PDB-85-19	Proboscidea	Gomphoteriidae	<i>Stegomastodon platensis</i>	Tooth enamel	-6.1	-3.0	27.8	19.1	8.8
MD-PDB-08-20	Proboscidea	Gomphoteriidae	<i>Stegomastodon platensis</i>	Tooth enamel	-3.0	-1.7	29.2	21.2	8.0
MD-PDB-99-43	Proboscidea	Gomphoteriidae	<i>Stegomastodon platensis</i>	Tooth enamel	-6.4	-2.4	28.5		
MD-PDB-90-17	Perissodactyla	Equidae	<i>Equus (Amerhippus) neogeus</i>	Tooth enamel	-6.7	-1.8	29.1		
MD-PDB-84-5	Artiodactyla	Cervidae	<i>Morenelaphus</i> sp.	Tooth enamel	-10.4	-1.7	29.2	21.1	8.1
MD-PDB-84-5	Artiodactyla	Cervidae	<i>Morenelaphus</i> sp.	Tooth enamel	-10.4	-1.9	28.9	20.3	8.7

MD-PDB-84-4	Artiodactyla	Cervidae	<i>Morenelaphus</i> sp.	Tooth enamel	-11.4	-1.4	29.4	19.9	9.6
MD-PDB-84-4	Artiodactyla	Cervidae	<i>Morenelaphus</i> sp.	Tooth enamel	-9.6	-1.4	29.5	20.6	8.9
MD-PDB-05-2	Artiodactyla	Cervidae	<i>Morenelaphus</i> sp.	Tooth enamel	-9.0	-0.9	30.0	22.0	8.0
MD-PDB-05-110	Artiodactyla	Cervidae	<i>Morenelaphus</i> sp.	Tooth enamel	-10.3	-1.6	29.3		
MD-PDB-05-108	Artiodactyla	Cervidae	<i>Morenelaphus</i> sp.	Tooth enamel	-10.4	-2.2	28.7		
MD-PDB-83-99-1	Carnivora	Felidae	<i>Smilodon populator</i>	Tooth enamel	-7.6	-1.6	29.3		
MD-PDB-83-99-2	Carnivora	Felidae	<i>Smilodon populator</i>	Tooth enamel	-7.1	-1.1	29.8		
MD-PDB-83-99-3	Carnivora	Felidae	<i>Smilodon populator</i>	Tooth enamel	-8.6	-2.2	28.6		
MD-PDB-83-99-4	Carnivora	Felidae	<i>Smilodon populator</i>	Tooth enamel	-8.5	-2.0	28.8		
MD-PDB-83-99-5	Carnivora	Felidae	<i>Smilodon populator</i>	Tooth enamel	-7.7	-1.2	29.7		
