

Supplementary Materials for

Bone marrow storage and delayed consumption at Middle Pleistocene Qesem Cave, Israel (420 to 200 ka)

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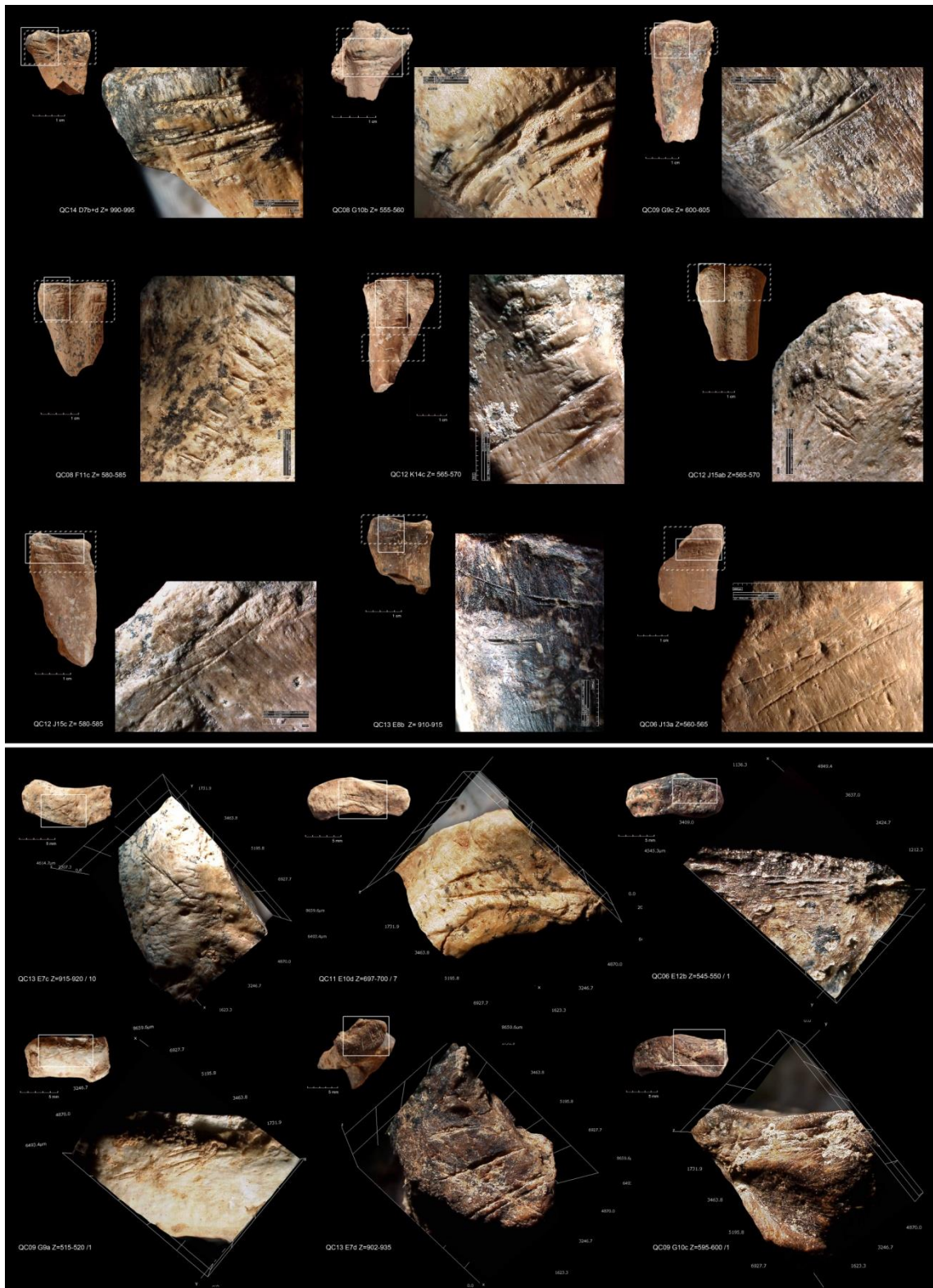
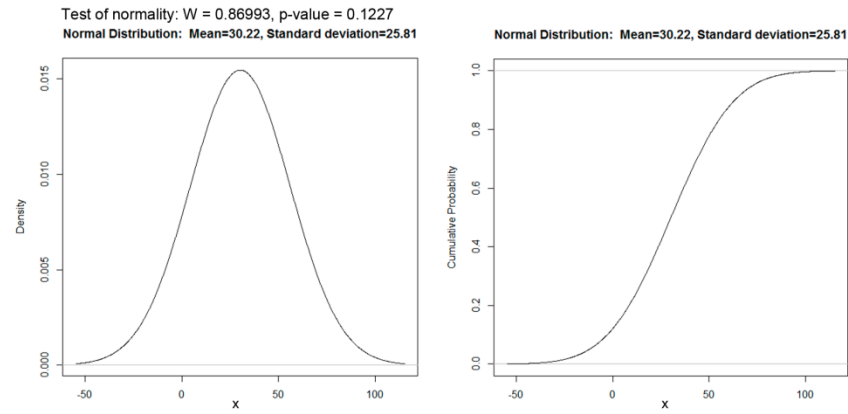
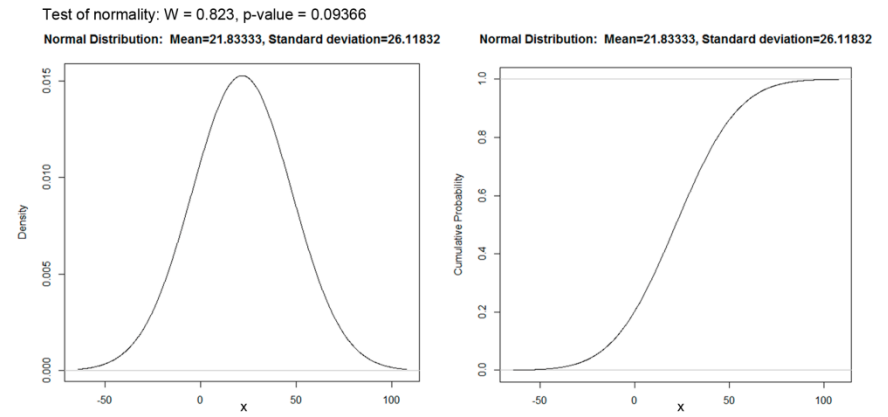


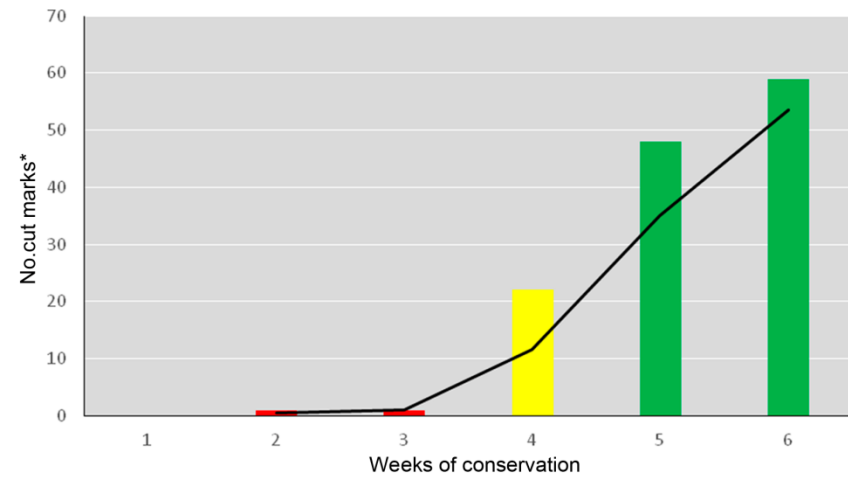
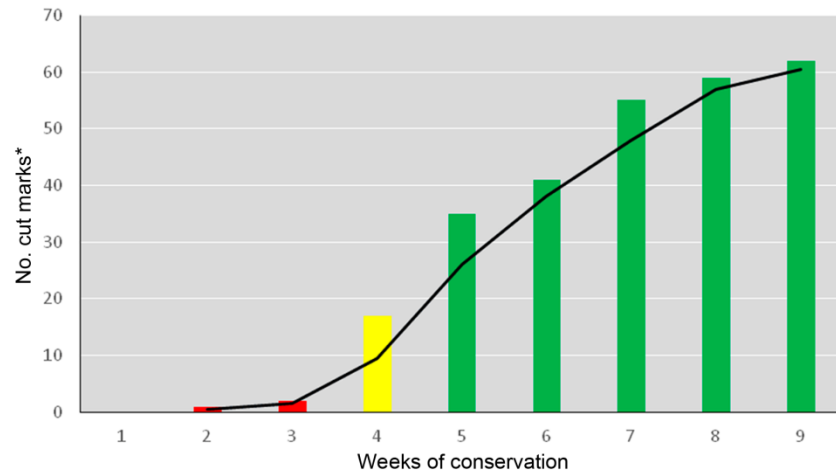
Fig. S1. Examples of cut marks associated to disarticulation and/or skinning from Amudian and Yabrudian levels of Qesem Cave. (Top) Transverse (and slightly oblique) incisions on proximal epiphysis and metaphysis of metapodials; (bottom) cut-marked basipodials of fallow deer. Dotted lines show the area of the bone with cut marks (including not only the surface shown in detail). The 3D images and details were generated by a KH-8700 3D Digital Microscope. Photo credits: R. Blasco.



Scenario 1



Scenario 2



*cut marks showing inclination almost parallel to the bone

Fig. S2. Test of normality and graphs showing the number of cut marks with inclination almost parallel to the bone and weeks of conservation by scenarios (SC 1 and SC 2). Note an increase of cut marks in line with the exposure time and especially from the fourth week onwards.



Fig. S3. Examples of different actions (skinning, tendon removal, and bone breakage) during the development of the SC 1. Note the use of the tool with an inclination almost parallel to the bone in A and B (week 4). Images in D and E show the beginning of the skin removal on the proximal part of the metapodials (weeks 6 and 8); A and C show the tendons removal in combination with skinning, and F, the extraction of the tendon after skinning. Note the ease of tendon removal when still fresh/semi-fresh in F (week 1), which is only attached to the bone through proximal and distal extremities; only a few cuts are needed to obtain it. Images in G to I show the bone breakage process during the fourth and fifth week. Note that no well-defined notches appear in H and I. Photo credits: M. Arilla.

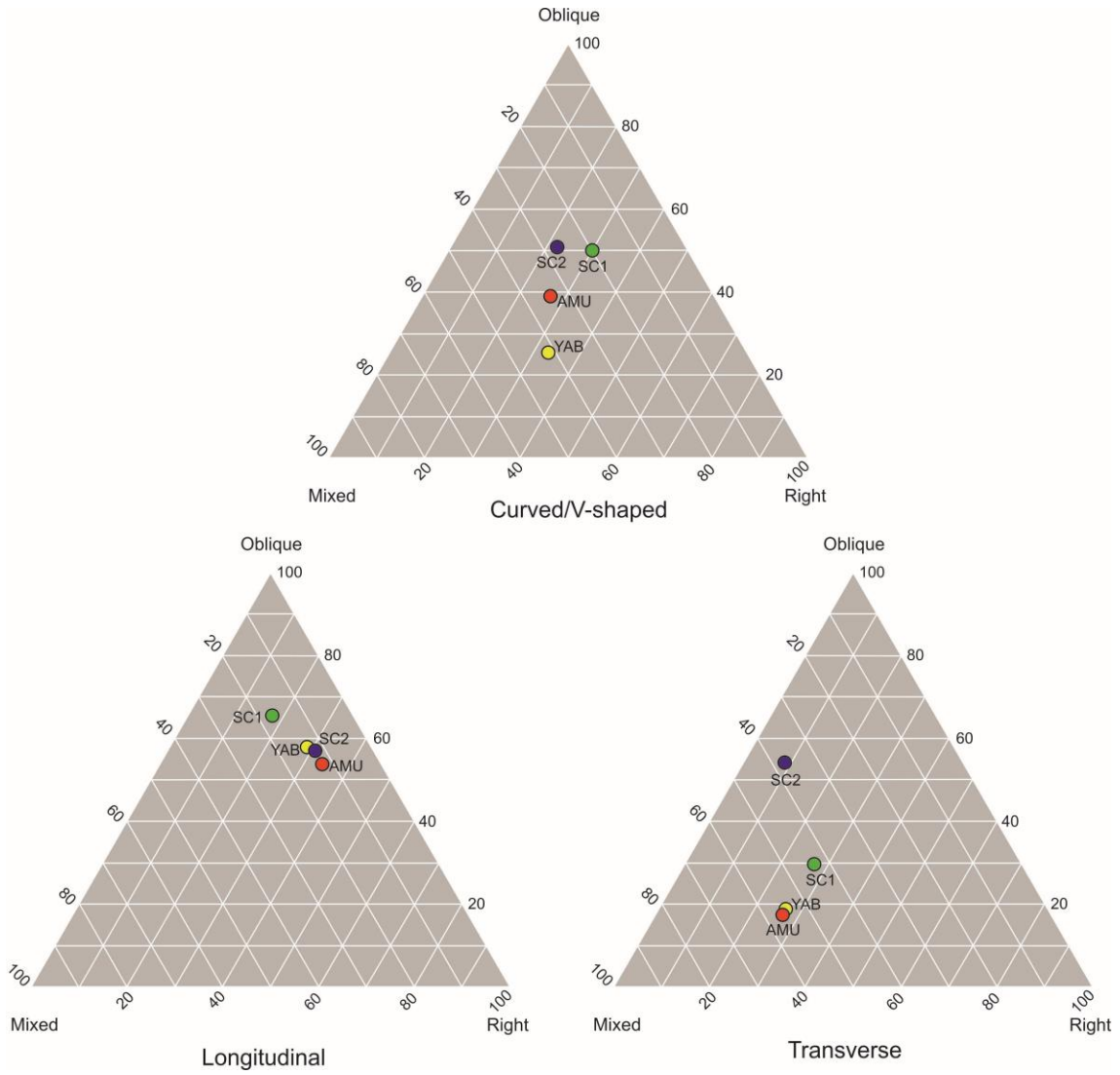


Fig. S4. Ternary plots showing analysis of bone break planes (outline, angle, and surface edge) of metapodials with more than 20 mm length from experimental series [outdoor (autumn and spring) scenarios] and Qesem Cave faunal assemblage following the criteria established by Villa and Mahieu (31).

Table S1. Variation on FAME (%) composition according to the week of conservation in the outdoor (autumn) scenario (SC 1).

FAME (%)	week of conservation					slope	p-value
	0	2	4	6	8		
C14:0	1.88	1.56	1.48	1.01	1.70	-0.046	0.2014
C14:1(n-5)	3.00	1.66	2.65	1.37	2.12	-0.103	0.1659
C15:0	0.56	0.90	0.44	0.50	0.89	0.013	0.6177
C16:0	10.04	13.17	10.40	10.09	12.10	0.052	0.7483
C16:1(n-7)	16.64	11.66	16.69	13.80	14.45	-0.111	0.6511
C17:0	0.36	0.66	0.33	0.45	0.58	0.012	0.4427
C17:1(n-7)	1.15	1.60	1.06	1.86	1.94	0.092	0.0182*
C18:0	2.35	2.32	2.44	0.83	1.47	-0.162	0.0181*
C18:1 ¹	1.10	1.02	0.50	0.36	0.40	-0.104	0.0307*
C18:1(n-9)	36.52	34.08	35.58	30.91	31.20	-0.691	0.0014*
C18:1 ²	10.60	2.00	13.17	6.18	2.82	-0.569	0.2915
C18:2(n-6)	2.42	2.12	2.69	1.97	1.88	-0.061	0.0792
C18:3(n-3)	1.03	1.09	1.29	0.73	0.73	-0.048	0.0536
C20:1	0.55	0.00	0.54	0.39	0.20	-0.016	0.5575
Non ident	11.80	25.78	10.74	28.97	27.23	1.702	0.0631
Monosaturated	77.57	68.42	77.44	75.45	70.73	-0.003	0.4793
Polyunsaturades	3.91	4.34	4.46	3.80	3.59	-0.001	0.1362
Saturated	18.52	27.24	18.09	20.75	25.68	0.004	0.4069

*Statistically significant values.

¹ (E)-octadec-9-enoic acid

² (E)-octadec-11-enoic acid

Table S2. Weight and energy data (kcal) from the metapodial bones by experimental scenario and exposure time.

Exposure time (weeks)	Scenario	Lab reference	Metapodium weight ⁽¹⁾	Tendon weight		Marrow weight	Marrow %	Energy (Kcal)	% Steak 100g
				Dorsal	Anterior				
0	SC1	0B.1	124.4	32.9	3.4	7.1	5.7%	66.74	12%
1	SC1	1B.1	95.8	27	4.9	6.6	6.9%	62.04	11%
1	SC1	1B.2	70	23.1	4.6	6.3	9.0%	59.22	10%
2	SC1	2B.2	97	23.9	5.3	14.4	14.8%	135.36	24%
2	SC1	2B.1	103.3	36.6	6.3	11.8	11.4%	110.92	20%
3	SC1	3B.2	82.5	21.8	4.1	7	8.5%	65.8	12%
3	SC1	3B.1	100.7	27	3.4	4.2	4.2%	39.48	7%
4	SC1	4B.1	113.5	31.1	6.3	10.5	9.3%	98.7	17%
4	SC1	4B.2	127.5	34.1	8	7.4	5.8%	69.56	12%
5	SC1	5B.2	68.3	15.6	1.9	6.2	9.1%	58.28	10%
5	SC1	5B.1	99.1	21.3	3.1	2.2	2.2%	20.68	4%
6	SC1	6B.1	114.3	31	5.3	11.6	10.1%	109.04	19%
6	SC1	6B.2	61.2	12.1	1.9	4.2	6.9%	39.48	7%
7	SC1	7B.2	66.9	15.9	2	7.2	10.8%	67.68	12%
7	SC1	7B.1	84.3	14.7	2.4	5.9	7.0%	55.46	10%
8	SC1	8B.2	75.7	20.3	2.1	4.9	6.5%	46.06	8%
8	SC1	8B.1	98.7	18.1	2.9	0.4	0.4%	3.76	1%
9	SC1	9B.1	87.8	22	3.3	7.4	8.4%	69.56	12%
9	SC1	9B.2	116.8	20.5	2	6.6	5.7%	62.04	11%
0	SC2	0A.2	119.2	36.1	4.7	11.4	9.6%	107.16	19%
0	SC2	0A.1	179	34.6	7	10.3	5.8%	96.82	17%
1	SC2	1A.1	151.9	28.4	6.8	8.8	5.8%	82.72	15%
1	SC2	1A.2	106.2	37.5	4.4	5.8	5.5%	54.52	10%
2	SC2	2A.1	122.4	26.6	6.3	11.4	9.3%	107.16	19%
2	SC2	2A.2	113.8	26	2.5	3.5	3.1%	32.9	6%
3	SC2	3A.1	92.2	18.3	3.8	4.9	5.3%	46.06	8%
3	SC2	3A.2	100.7	15.9	3.9	4.4	4.4%	41.36	7%
4	SC2	4A.2	89.2	16.6	2.3	4.9	5.5%	46.06	8%
4	SC2	4A.1	96.3	8.1	2.5	3.5	3.6%	32.9	6%
5	SC2	5A.1	103.7	12.7	3.3	5.7	5.5%	53.58	9%
5	SC2	5A.2	126.5	14.7	3.9	1.2	0.9%	11.28	2%
6	SC2	6A.2	151.6	14.8	4.2	4.6	3.0%	43.24	8%
6	SC2	6A.1	143.9	11.6	3.1	0.3	0.2%	2.82	0%
1	SC3	1C.3 ⁽²⁾	59.3	-	-	4.6	7.8%	43.24	8%
1	SC3	1C.1	75.8	23.2	4.1	4.5	5.9%	42.3	7%
1	SC3	1C.2	61.4	19.3	1.9	3.4	5.5%	31.96	6%
2	SC3	2C.2	68.4	12	2.5	3.3	4.8%	31.02	5%
2	SC3	2C.3 ⁽²⁾	62.5	-	-	3	4.8%	28.2	5%
2	SC3	2C.1	53.3	11	1.5	1.4	2.6%	13.16	2%
3	SC3	3C.1	76.2	19.6	2.7	4.4	5.8%	41.36	7%
3	SC3	3C.3 ⁽²⁾	67.6	-	-	3.6	5.3%	33.84	6%
3	SC3	3C.2	51.2	10.7	1.4	2	3.9%	18.8	3%
4	SC3	4C.2	50.2	8.3	1.6	1.5	3.0%	14.1	2%
4	SC3	4C.3 ⁽²⁾	42.3	-	-	1.2	2.8%	11.28	2%
4	SC3	4C.1 ⁽³⁾	62.3	12.4	2.1	0.3	0.5%	2.82	0%

SC 1=Outdoor (autumn) scenario; SC 2= Outdoor (spring) scenario; SC 3= Indoor simulation.

(1) Weight without skin and tendons; (2) metapodials without skin during the exposure time; (3) presence of worms.