Backed pieces and their variability in the Later Stone Age of the Horn of Africa

Alice Leplongeon[1,2,3*#]
Clément Ménard[4*#]
Vincent Bonhomme[5]
Eugenio Bortolini[6]

Affiliations

1 Postdoctoral fellow of the Research Foundation – Flanders (FWO), Department of Archaeology, KU Leuven, Celestijnenlaan 200e, 3001 Leuven, Belgium
2 Institute of Advanced Studies, University of Bologna, Via Marsala 26, 40126 Bologna, Italy
3 UMR CNRS 7194, Département Homme et Environnement, Muséum national d'Histoire naturelle – Université de Perpignan Via Domitia – Sorbonne Université, Institut de Paléontologie Humaine, 1 rue Panhard, 75013 Paris, France
4 Centre français des études éthiopiennes, P.O. Box 5554, Addis Ababa, Ethiopia
5 ISEM, Univ Montpellier, CNRS, EPHE, IRD, Montpellier, France
6 Department of Cultural Heritage, University of Bologna, Via degli Ariani 1
48121 Ravenna, Italy

* Corresponding authors: alice.leplongeon@kuleuven.be, clement.menard@cfee.cnrs.fr

# These authors contributed equally to this work

Kruskal-Wallis (KW) rank sum test: assemblage by weight

KW chi-squared	72.115
p-value	5.52E-13

Mann-Whitney (MW) pair-wise tests, with Bonferoni correction of the p-value

		B1s1_Lower	B1s1_Upper	DW2s2AB	DW2s3	GBIIC	MB_3010	MB_7	GBI
B1s1_Lower	M-W statistic	NA							
	M-W corr. Pvalue								
B1s1_Upper	M-W statistic	9.5	NA						
	M-W corr. Pvalue	0.0008							
DW2s2AB	M-W statistic	28	207	NA					
	M-W corr. Pvalue	1	0.2180						
DW2s3	M-W statistic	2	72	24.5	NA				
	M-W corr. Pvalue	1.48E-05	1.68E-05	0.0003					
GBIIC	M-W statistic	24.5	300	77.5	516.5	NA			
	M-W corr. Pvalue	0.0197	1	1	9.42E-06				
MB_3010	M-W statistic	58.5	750.5	185	1178.5	544.5	NA		
	M-W corr. Pvalue	0.0069	0.3877	1	3.05E-09	1			
MB_7	M-W statistic	21.5	449	93.5	794	315.5	574	NA	
	M-W corr. Pvalue	0.0010	1	0.4832	2.40E-06	1	1		
GBI	M-W statistic	16	220	53.5	404.5	167	300	272.5	NA
	M-W corr. Pvalue	0.0222	1	1	1.31E-05	1	1	1	

Kruskal-Wallis (KW) rank sum test: assemblage by length

KW chi-squared	66.608
p-value	7.14E-12

Mann-Whitney (MW) pair-wise tests, with Bonferoni correction of the p-value

		B1s1_Lower	B1s1_Upper	DW2s2AB	DW2s3	GBIIC	MB_3010	MB_7	GBI
B1s1_Lower	M-W statistic	NA							
	M-W corr. Pval								
B1s1_Upper	M-W statistic	8	NA						
	M-W corr. Pval	0.0007							
DW2s2AB	M-W statistic	46	221.5	NA					
	M-W corr. Pval	1	0.0437						
DW2s3	M-W statistic	8	101	18	NA				
	M-W corr. Pval	0.0004	0.0007	0.0008					
GBIIC	M-W statistic	15.5	232	37	457.5	NA			
	M-W corr. Pval	0.0047	1	0.0551	0.0087				
MB_3010	M-W statistic	47	660.5	114	1083	603.5	NA		
	M-W corr. Pval	0.0026	1	0.1427	0.0000	1			
MB_7	M-W statistic	18	358.5	54.5	732	349	547	NA	
	M-W corr. Pval	0.0007	1	0.0169	0.0006	1	0.9938		
GBI	M-W statistic	20	119	23.5	351.5	144	185	185	NA
	M-W corr. Pval	0.0480	1	0.0444	0.0194	1	0.0930	1	

Kruskal-Wallis (KW) rank sum test: assemblage by width

KW chi-squared	69.12
p-value	2.23E-12

Mann-Whitney (MW) pair-wise tests, with Bonferoni correction of the p-value

		B1s1_Lower	B1s1_Upper	DW2s2AB	DW2s3	GBIIC	MB_3010	MB_7	GBI
B1s1_Lower	M-W statistic	NA							
	M-W corr. Pvalue								
B1s1_Upper	M-W statistic	14.5	NA						
	M-W corr. Pvalue	0.0020							
DW2s2AB	M-W statistic	22	138	NA					
	M-W corr. Pvalue	0.6189	1						
DW2s3	M-W statistic	2	34.5	16.5	NA				
	M-W corr. Pvalue	0.0002	1.36E-06	0.0006					
GBIIC	M-W statistic	28.5	191.5	86.5	520	NA			
	M-W corr. Pvalue	0.0368	1	1	2.59E-05				
MB_3010	M-W statistic	71	513	229.5	1165.5	570	NA		
	M-W corr. Pvalue	0.0195	1	1	1.42E-08	1			
MB_7	M-W statistic	16.5	277	139.5	818	363	633.5	NA	
	M-W corr. Pvalue	0.0006	1	1	9.00E-07	1	1		
GBI	M-W statistic	17	172.5	81	404	199.5	371	314.5	NA
	M-W corr. Pvalue	0.0274	1	1	6.82E-05	1	1	1	

Kruskal-Wallis (KW) rank sum test: assemblage by thickness

KW chi-squared	80.144
p-value	1.29E-14

Mann-Whitney (MW) pair-wise tests, with Bonferoni correction of the p-value

		B1s1_Lower	B1s1_Upper	DW2s2AB	DW2s3	GBIIC	MB_3010	MB_7	GBI
B1s1_Lower	M-W statistic	NA							
	M-W corr. Pval								
B1s1_Upper	M-W statistic	18.5	NA						
	M-W corr. Pval	0.0370							
DW2s2AB	M-W statistic	41	215.5	NA					
	M-W corr. Pval	1	0.0881						
DW2s3	M-W statistic	7	133.5	25	NA				
	M-W corr. Pval	0.0004	0.0093	0.0021					
GBIIC	M-W statistic	65.5	425	105	533.5	NA			
	M-W corr. Pval	1	0.0024	1	5.93E-06				
MB_3010	M-W statistic	128	903	229	1164.5	479	NA		
	M-W corr. Pval	0.8329	0.0004	1	1.49E-08	1			
MB_7	M-W statistic	49	497.5	104	755.5	177	442.5	NA	
	M-W corr. Pval	0.0248	1	1	0.0001	0.0752	0.0467		
GBI	M-W statistic	57.5	350.5	93.5	416	192.5	422	433.5	NA
	M-W corr. Pval	1	0.0004	1	1.47E-05	1	1	0.0086	

Kruskal-Wallis (KW) rank sum test: assemblage by elongation index

KW chi-squared	46.65
p-value	6.54E-08

Mann-Whitney (MW) pair-wise tests, with Bonferoni correction of the p-value

		B1s1_Lower	B1s1_Upper	DW2s2AB	DW2s3	GBIIC	MB_3010	MB_7	GBI
B1s1_Lower	M-W statistic	NA							
	M-W corr. Pval								
B1s1_Upper	M-W statistic	106	NA						
	M-W corr. Pval	1							
DW2s2AB	M-W statistic	92	225.5	NA					
	M-W corr. Pval	0.2845	0.0266						
DW2s3	M-W statistic	247	588.5	151	NA				
	M-W corr. Pval	0.0038	1.76E-05	1					
GBIIC	M-W statistic	99.5	258	55	119	NA			
	M-W corr. Pval	1	1	0.4840	0.0183				
MB_3010	M-W statistic	273	703.5	111.5	235.5	548.5	NA		
	M-W corr. Pval	1	1	0.1219	0.0003	1			
MB_7	M-W statistic	189	494.5	74.5	157	383	734	NA	
	M-W corr. Pval	1	1	0.1089	0.0005	1	1		
GBI	M-W statistic	56	146	23	38	136.5	231.5	168.5	NA
	M-W corr. Pval	1	1	0.0407	0.0002	1	0.8025	1	

Kruskal-Wallis (KW) rank sum test: assemblage by flattening index

KW chi-squared	39.5
p-value	1.57E-06

Mann-Whitney (MW) pair-wise tests, with Bonferoni correction of the p-value

		B1s1_Lower	B1s1_Upper	DW2s2AB	DW2s3	GBIIC	MB_3010	MB_7	GBI
B1s1_Lower	M-W statistic	NA							
	M-W corr. Pval								
B1s1_Upper	M-W statistic	167	NA						
	M-W corr. Pval	1							
DW2s2AB	M-W statistic	35.5	49.5	NA					
	M-W corr. Pval	1	0.0999						
DW2s3	M-W statistic	91.5	155	146.5	NA				
	M-W corr. Pval	1	0.0413	1					
GBIIC	M-W statistic	43	49.5	95	248.5	NA			
	M-W corr. Pval	0.2619	0.0001	1	1				
MB_3010	M-W statistic	134.5	152.5	267.5	655	615	NA		
	M-W corr. Pval	1	2.22E-05	1	1	1			
MB_7	M-W statistic	135.5	197	220.5	534.5	502	935	NA	
	M-W corr. Pval	1	0.0374	1	1	0.1667	1		
GBI	M-W statistic	28	32.5	74.5	182.5	160.5	259.5	131	NA
	M-W corr. Pval	0.1857	0.0003	1	1	1	1	0.1323	

Kruskal-Wallis (KW) rank sum test: assemblage by relative back thickness index

KW chi-squared	34.82
p-value	1.21E-05

Mann-Whitney (MW) pair-wise tests, with Bonferoni correction of the p-value

		B1s1_Lower	B1s1_Upper	DW2s2AB	DW2s3	GBIIC	MB_3010	MB_7	GBI
B1s1_Lower	M-W statistic	NA							
	M-W corr. Pvalue								
B1s1_Upper	M-W statistic	139	NA						
	M-W corr. Pvalue	1							
DW2s2AB	M-W statistic	40	82	NA					
	M-W corr. Pvalue	1	1						
DW2s3	M-W statistic	133	278	186.5	NA				
	M-W corr. Pvalue	1	1	1					
GBIIC	M-W statistic	160	340	193	423	NA			
	M-W corr. Pvalue	0.5957	1	0.0630	0.1082				
MB_3010	M-W statistic	346	722	419	918	452.5	NA		
	M-W corr. Pvalue	0.3773	1	0.0229	0.0197	1			
MB_7	M-W statistic	261	567	311	698.5	383.5	886	NA	
	M-W corr. Pvalue	0.1692	0.1640	0.0132	0.0049	1	1		
GBI	M-W statistic	108	218	130	279	117.5	279	164	NA
	M-W corr. Pvalue	1	1	1	1	1	1	0.9490	