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Animal Bones from Ḥorbat Ṭarbenet

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Introduction

Salvage excavations at Ḥorbat Ṭarbenet, in the Jezreel Valley, revealed architecture dating mainly from the Byzantine period. Among the architectural features were a well and a pool, the latter thought to be part of a bathhouse (Mokary 2015; see Atrash and Mazor, this volume). The animal-bone remains comprise specimens recovered from the vicinity of the pool and dated to the Byzantine–Umayyad periods and a handful of specimens dated, by associated pottery, to the Hellenistic–Early Roman periods. The remains appear to represent fills dumped inside and around the hydraulic installations and are not necessarily informative of animal consumption activities in the immediate vicinity of the excavated contexts.

Methodology

The animal bones from Ḥorbat Ṭarbenet were collected by hand and stored in two standard archive boxes. The bones had to be cleaned from adhering sediments before analysis using tap water and a toothbrush. Subsequently, they were dried in the shade and returned to their original packages.

Bone identification relied on the comparative osteological collection of the Laboratory of Archaeozoology at the University of Haifa. Morphologically similar taxa, such as sheep and goats, or horses and donkeys, were distinguished using metric and morphological criteria (Davis 1980; Eisenmann 1986; Zeder and Lapham 2010). Taxonomic abundances were estimated based on the number of identified specimens (NISP) and the minimum number of animal units (MAU). Bone counting procedures followed Albarella and Davis (1994; for methodological verification and discussion, see Marom and Bar-Oz 2008 and Trentacoste 2009). The state of tooth wear (Payne 1973 for caprines and Grant 1982 for cattle and pigs) or the state of epiphyseal fusion (Silver 1969) were noted for all relevant specimens. Measurements were taken with Vernier calipers following Davis (1992) based largely on Driesch's (1976) protocol.

The presence of gnawing marks, burning and weathering (Stage 2 and up; Behrensmeyer 1978) was recorded for the always-counted parts of the skeleton (POSACs; a limited set of

skeletal element diagnostic zones that is the basis for NISP and MAU calculations), and so was fracture morphology (Villa and Mahieu 1991). Butchery marks were recorded in detail for all POSACs, and described for other specimens when they were deemed of special interest.

RESULTS

Very few remains were recovered from Hellenistic–Early Roman loci (NISP = 24 and NISP = 29, respectively). These include eight cattle (*Bos taurus*) teeth (five mandibular first and second molars; one unworn third molar; one worn fourth deciduous premolar; one third premolar) and a small equid astragalus which may have belonged to a donkey (*Equus asinus*; GB = 33.8).

A somewhat larger sample of bones (NISP = 40) was obtained from the Byzantine–Umayyad loci (Table 1). Caprine (sheep, *Ovis aries*, and goats, *Capra hircus*) remains are nearly absent (NISP = 1, 3%); a single non-countable (i.e., a part not included in recorded bone list) radius fragment is cut-marked. Cattle form the mainstay of the sample (NISP = 28, 70%); except for a single bone (an ulna), all specimens are fused and therefore appear to represent adult individuals. Two worn third molars further agree with the estimation for an adult age-at-death (Table 2), indicating that the population from which these animals were obtained was kept for milk and work rather than beef (Payne 1973). Further evidence for the cattle's employment for draft is a pathology associated with chronic strain on a metatarsus from L48 (Fig. 1). All portions of the animals are represented in the assemblage, indicating no body-part selection by humans, very much expected from the eclectic nature of a fill deposit.

Fig. 1. Metatarsus pathology (L48).

Table 1. Byzantine–Umayyad Loci: Bone Count by Element, Taxon and State of Epiphyseal Fusion

POSAC	Age[i]	Caprine	Cattle	Equid	Camel[ii]
PM				4	
M1/2		1	1		2 (2)
M3			2		1 (1)
Zygomatic			1		
Scapula	F		1		
	U				
	?				
Humerus	F		1		
	U			1	
Radius	F		1		
	U				
Ulna	F				
	U		1		
	?		1		
Carpal 1+2			1		
Metacarpus	F				1
	U				
Pelvis	F				
	U				
Femur	F		1		
	U				
Tibia	F		5		
	U				
Astragalus	F		1		
	U				
Calcaneus	F		1		1
	U				
	?				
Metatarsus	F		1	1	
	U				
Phalanx I	F		6		
	U				
Phalanx II	F				
	U				
Phalanx III	F		3		
	U				
NISP		1	28	6	5
MAU		1	3	1	1

[i] F = Fused; U = Unfused; ? = Undetermined.

[ii] Numbers in parentheses indicate the number of teeth in mandibles, not included in the total.

Table 2. Bone Measurements (in mm)

Taxon	Element/ POSAC	Age	Measurements[i]			Locus	Basket	Period[ii]
Camel	M3		L	wi	wii			
		Adult	53	19.8		14	1095	Byz.–Um.
		Adult	54.6	19.9	20.5	79	1408	Mixed
Cattle	dp4		L	wi	wii			
		l	26.1	13.1	11.7	29	1247	Hell.–Rom.
	M3		L	wi	wii			
		f	37.1	15.9		16	1068	Byz.–Um.
		j	33.8	15.4	14.2	44	1246	Byz.–Um.
		a	37.3	13.4		29	1247	Hell.-Rom.
	Humerus		BT	HTC				
			71.3	32.2		27	1085	Byz.–Um.
				32.8		45	1213	Mixed
	Femur		Bd					
			79.2			18	1029	Byz.–Um.
	Tibia		*Bd*	*Dd*				
			66.3	49.5		75	1356	Byz.
			62.3	45.4		12	1002	Byz.–Um.
			52.7	38.9		16	1068	Byz.–Um.
			54.9	43.7		76	1335	Byz.–Um.
	Metatarsus pathology		Bd	Dd	SD			
			54.8	32.6	28.8	48	1219	Mixed
	Phalanx 1		Bp	Bd	GLpe			
			24.5	24.9	54.5	73	1306	Byz.
			33.8	34.2	70.5	18	1018	Byz.–Um.
			27	24.1	50.8	18	1018	Byz.–Um.
			33.2	30	54.3	18	1018	Byz.–Um.
				29.4	55.8	18	1029	Byz.–Um.
			33.7	29	62.9	27	1098	Byz.–Um.
			26.3	25.5	53.3	20	1127	Mixed
	Phalanx 2		Bp	Bd				
			27.3	23.2		11	1011	Byz.–Um.
			25.4	22.5		17	1052	Byz.–Um.
			28.7	24.1		52	1265	Mixed
Equid	Astragalus		GB					
			33.8			24	1043	Hell.–Rom.

[i] For abbreviations, see Driesch 1976.

[ii] Hell. = Hellenistic; Rom. = Roman; Byz. = Byzantine; Um. = Umayyad.

Equid remains (NISP = 6, 15%) include one horse (*Equus caballus*) and four donkey (*Equus asinus*) teeth. The teeth are very worn and belonged to older individuals. The single identified equid post-cranial bone, a humerus, was unfused, indicating the presence of younger individuals. A camel (*Camelus dromedarius*; NISP = 5, 13%) mandible, maxillary canine, metapodial and calcaneus indicate the occasional death of one of these long-distance trade animals by the site.

Lastly, in terms of assemblage preservation and taphonomic history, it would appear that many of the bones were broken after having dried, since only three of seven specimens for which fracture morphology was recorded showed the typical smooth and spiral fracture morphology associated with breakage of fresh bones. Many bones (N = 6, 21%) were gnawed, mostly by dogs, with a single bone scored by a large rodent (likely porcupine, *Hystrix indicus*). Two specimens (7%) were heavily weathered from prolonged surface exposure before burial. Recovery bias is suggested by the paucity of smaller bone elements (incisors, distal phalanges) and the absence of bones from smaller taxa.

Summary and Conclusions

The faunal assemblage from Ḥorbat Ṭarbenet represents tertiary deposition of faunal remains and associated sediments and finds. This is suggested not only by the mixed chronology and nature of all types of material remains, but also by the fauna, which comprises primarily beasts of burden, such as equids and camels. Asses, horses and camels are usually excluded from kitchen waste, and their carcasses are often thrown away in the settlement's periphery. The high frequencies of fractures on already-dry bone, and carnivore gnawing marks, also suggest a deposition scenario that includes little human processing of bones for food and early discard some distance away from the main activity areas of the settlement, where scavenging dogs had access to the bones.

The high frequency of older (probably draft) cattle may indicate that the livestock animals slaughtered in Ḥorbat Ṭarbenet originated in an economic system that prioritized agriculture over the traditional agro-pastoral economy. In all Byzantine faunal assemblages known to me, however, sheep and goats outnumber cattle (with the exception of Bab al-Hawa; Raphael and Lernau 1996). This observation, however, should be treated with care due to the uncertain context in which the bones were found, i.e., the fill probably does not represent the site's economy.

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