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DIETARY DIFFERENCES AT EZ ZANTUR PETRA, JORDAN (1ST CENTURY BC-AD 5TH CENTURY)

Jacqueline Studer[1]

Abstract

Since 1988, a Swiss archaeological mission from the University of Basel has been involved in the excavation of several residential buildings in the ancient town in Petra (Jordan), at ez Zantur. The oldest houses from ez Zantur were built during the Nabataean period, and the more recent ones during the Late Roman period. It seems that people from different social strata inhabited these houses.

Analyses of the bone remains have demonstrated that during both periods, and independently of social class, meat consumption was mainly based on sheep and goat, a dietary pattern which continues even today in the region. However, a difference was noted between the two periods as well as between residential areas, in the frequency and variety of the other species, particularly wild birds and fish, that were consumed. The latter differences have been interpreted as being due to differences in social status between areas in the site, while the former differences may be due to new populations occupying the site.

Résumé

Depuis 1998, une mission archéologique Suisse de l'Université de Bâle a fouillé plusieurs bâtiments résidentiel à ez Zantur dans l'ancienne ville de Petra (Jordanie). Les maisons les plus anciennes d'ez Zantur etaient bâties durant la période Nabatéenne, et les plus récentes durant la période romaine. Il semble que des gens de différentes classes sociales habitaient ces maisons.

L'analyse des ossements montre que durant les deux périodes et indépendamment de la classe sociale, la viande la plus consommée était celle du mouton et de la chèvre, un schémas qui perdure jusqu'aujourd'hui. Cependant une différence est notée entre les deux périodes, ainsi qu'entre les zones résidentielles dans la fréquence et la variété d'autres espèces, particulièrement celles des oiseaux sauvages et du poisson. Les différences dans les taux de poisson sont interprétée comme étant dues à la différence de classe sociale entre les divers zones du site, alors que les différences observées chez les oiseaux sauvages pourraient être attribuées à l'occupation du site par une nouvelle population.

Key Words: Petra, Nabataean-Late Roman, Trade, Species variability, sSocial status

Mots Clés: Petra, Nabataean-romain tardif, Commerce, Variabilité specifique, Statut social

Introduction

In order to investigate chronological differences in diet based on the analysis of animal remains, it is imperative that the faunal assemblages that are used in such diachronic studies are truly comparable. This is because variation may be introduced into the assemblages due to factors other than chronology, such as differences in the function of areas within the site, in the function of different structures, the ethnic identity of the sites' inhabitants or their socio-economic status. As has been pointed out by researchers working on material from urban sites, the major issue to be assessed before any comparisons can be undertaken is to establish the origin of the faunal assemblages (see for example Crabtree 1990, LeeDecker 1994, Gumerman 1997 for an overview). It is therefore necessary to consider features such as the function of different areas within a site, the function of structures from which the bones are derived and even the function of different rooms or installations within the structures, before undertaking a comparison of bones assemblages. Furthermore, it is essential to establish whether the assemblages being compared are *in situ* and whether the archaeological material found, including the bones, is contemporaneous with the structures and is directly associated with their function. When these basic questions are resolved, there is still another parameter to evaluate, namely the socio-economic status of the inhabitants, which may vary between locations within the site. All these factors need to be considered before attributing any differences in the faunal spectrum to chronological change.

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The bone assemblages from the site of ez Zantur in Petra, Jordan, are a good example with which to investigate the complexity of such a study. As will be discussed in this paper, the frequency and variation in the species that were consumed depended not only on chronological evolution, but also on the social status of the inhabitants.

Background to the faunal assemblages from ez Zantur

Petra, the capital of the Nabataean kingdom, was situated at a strategic position at the crossroads of commercial routes, half way between the Red and the Dead Seas. The city flourished between the 1st century BC and the AD 1st century. In the year AD 106, Emperor Trajan annexed the kingdom, and the still prosperous city became the capital of the Arabian Roman Province. Under Byzantine rule, Petra was the capital of *Palaestina tertia*.

Since 1988, a team of archaeologists from the Archaeological Institute of the University of Basel (Switzerland) has excavated three residential terraces at mount ez Zantur (Fig. 1), situated to the south of the city (Bignasca *et al.* 1996). Nabataean and Late Roman private houses have been found at ez Zantur, as well as a Nabataean workshop area. About 40,000 bones have been collected and analysed since the beginning of the excavation (Studer 1991,1996; Desse-Berset & Studer 1996).

In order to investigate variation in diet based on the faunal assemblage from ez Zantur, both chronological and spatial comparisons have been undertaken. The first issue dealt with, is diachronic change in diet from the beginning of the site's occupation in the 1st century BC, to the end of the occupation of the mound in the AD 5th century. The second topic deals with variation in dietary habits between the three residential terraces. For this purpose, the assemblages have been separated according to period and then by structure type for each terrace. In order to obtain suitably comparable faunal samples, bone samples were selected by taking into account several points:

Fig. 1. Aerial view of the ez Zantur mount showing Terraces EZ I and EZ IV (Photo University of Basel).

1. Chronology. The bone samples come from 5 phases (Bignasca *et al*. 1996): Nabataean 1 (1st century BC- AD 20), Nabataean 2 (AD 20 -106), Roman (AD 2nd to 3rd century), Late Roman I (beginning of the AD 4th century - AD 363), Late Roman II (early AD 380's – AD 419). However, not all these phases are equally represented in the terraces, and the quantity of bone per phase varies greatly. In addition, many bones could not be assigned to specific phases and could only be attributed to either Nabataean or Roman periods. Therefore, it was decided to consider only two major periods: the Nabataean period (1st century BC to AD 1st century), and the Late Roman period (AD 4th to 5th centuries). As will be illustrated later in this paper, it was necessary to use further sub-divisions by phase for a better understanding of particular features.

2. Location. Only two terraces provided large enough samples from both periods; the terrace ez Zantur I (EZ I), which contains a large Nabataean house (Stucky 1996) and two Late Roman houses (Kolb 1996), and the terrace ez Zantur IV (EZ IV), with one large private building constructed during the 1st century BC, but which continued to be occupied during the Late Roman period (Kolb 1998).

3. Method of collection. The majority of the bones were hand collected. Selected samples such as deposits from special structures and burnt layers, as well as all *in situ* deposits, were systematically sieved using a 3 mm to 1 mm mesh. As these sediment samples were taken regularly on each of the terraces, it can be assumed that the bone assemblages from each of the houses sampled are representative and comparable, except in the case of songbirds (see below).

4. Nature of bone remains. Only bones that may have played a role in culinary activities were included. For example bear bones, which may attest to the exploitation of animals for fur (Studer 1996: 367-8) or bones of dog or small rodents, species which were not consumed, were not included in the samples. Remains of small songbirds, all collected in sieved sediments, were also excluded, because there were found in only two localised accumulations (54 and 13 bones). In addition, there is some doubt about the role of these small birds in the diet habits of the inhabitants of ez Zantur: natural factors could also be responsible for these accumulations. In the case of molluscs, their study is still under way but the 1,000 shells identified to date (which come from 35 species) seem to represent mainly ornamental or raw material for crafts rather than dietary items[2]. Consequently, they were not included in the samples used here.

5. Archaeozoological methods. Comparisons of the faunal assemblages from the two residential terraces focused on the relative frequencies of the different species represented and examined variations in this feature for species that were consumed. Body part frequencies were not considered, as differences in this feature may be related to special activities between structures or within parts of the same structure. This was illustrated by Studer (1996: 371) in the spatial analysis of the Late Roman house H2 of EZ I, occupied between AD 363 and 419. Bone elements showed a biased distribution which relates to different activities that took place inside the house. There was butchery refuse in a corner of one room (74% of the skeletal elements were phalanges, crania and mandibles), whereas these elements represented less than 40% in the other, contemporaneous loci.

Following the selection of faunal remains from ez Zantur according to these criteria, the number of remains which could be used in this specific analysis correspond to a total of 7,364 bones (Table 1). The number of mammal and bird bones represent identified elements only, while the number of fish bones represent the total number of remains – identified and unidentifiable. The faunal assemblage from EZ I comprises 3,202 bones dated from the Nabataean period and 2,229 bones from the Late Roman period. The EZ II sample included 565 Nabataean bones and 1,369 Late Roman remains (Table 1).

[2] The molluscs are being studied by Yves Finet and the author.

Table 1. Number and frequencies of the consumed animals at ez Zantur.
Number of identified specimens NISP (mammals and birds), number of bones NR (fish).

a) Domestic mammals at EZ I and IV (cf. fig. 2)

DIET	Nabataean				Late Roman			
	EZ I		EZ IV		EZ I		EZ IV	
sheep and goat	2602	94%	315	90%	1339	91%	887	96%
pig	34	1%	19	5%	58	4%	18	2%
camel	102	4%	18	5%	35	2%	11	1%
donkey	11	0.50%	-	-	31	2%	3	0.50%
cattle	12	0.50%	-	-	15	1%	6	0.50%
total	**2761**	100%	**352**	100%	**1478**	100%	**925**	100%

DIET	Nabataean				Late Roman			
	EZ I		EZ IV		EZ I		EZ IV	
domestic mammals	2761	86%	352	62%	1478	66%	925	68%
wild mammals	23	1%	9	2%	8	1%	38	3%
birds	297	9%	180	32%	75	3%	213	16%
fish	121	4%	24	4%	668	30%	193	14%
total	**3202**	100%	**565**	100%	**2229**	100%	**1369**	100%

c) Domestic mammals, birds and fish at EZ I (cf. fig. 4)

DIET	Nabataean				Late Roman			
	EZ 1		EZ 2		EZ 1		EZ IV	
domestic mammals	1473	84%	926	93%	68	81%	590	50%
bird	186	11%	61	6%	13	15%	41	4%
fish	100	6%	8	1%	3	4%	546	46%
total	**1759**	100%	**995**	100%	**84**	100%	**1177**	100%

d) Domestic and wild birds at EZ I and IV (cf. fig. 5)

DIET	Nabataean				Late Roman			
	EZ I		EZ IV		EZ I		EZ IV	
domestic birds	264	89%	131	72%	68	91%	170	75%
wild birds	33	11%	49	28%	7	4%	43	25%
total	**297**	100%	**180**	100%	**75**	100%	**213**	100%

Changes in species frequencies

All species

There is no major difference in the range of domestic mammals consumed at ez Zantur: either between the Nabataean and Late Roman periods, or between the terraces EZ I and EZ IV (Fig. 2). The number of identified remains suggests that over 90% consisted of domestic ovicaprines, two-thirds sheep and one-third goat respectively. This pattern applies to both periods as well as to both terraces. It is obvious then, that information about changes in the diet will be seen only in species other than sheep or goat. It is interesting to note that cattle and donkey remains are extremely rare. Camel and pig make up a maximum of 5 % of the domestic mammals.

In order to observe differences in species representation, taxa were regrouped and the frequencies of four groups were considered: domestic mammals, hunted mammals (gazelle), birds (both domestic and wild) and fish (Fig. 3). However, we must bear in mind that bird and fish bones are much smaller and more fragile, and are therefore found more often when sediment-sieving is practised; their remains may be under-represented at ez Zantur, as not all deposits were sieved. Only 1% of the mammal remains represent bones collected during sieving. In contrast, 24% of the fish bones and 10%[3] of the bird bones are derived from the sieved samples. It appears that the relative frequencies between classes are not only linked to diet, but also to recovery techniques. Therefore, they demonstrate one of the important issues discussed in the introduction of this paper.

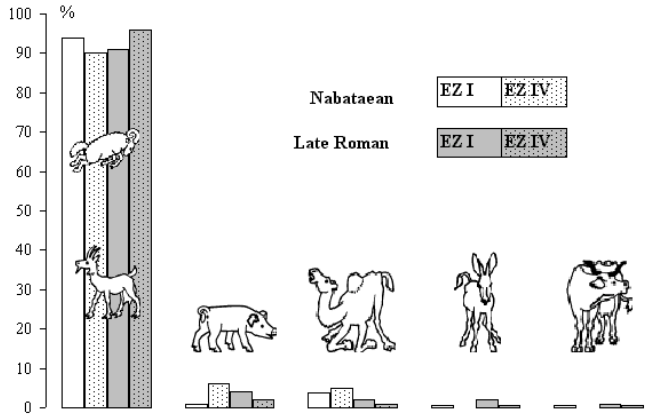

Fig. 2. Relative frequencies of domestic species consumed at ez Zantur I and IV (cf. table 1a).

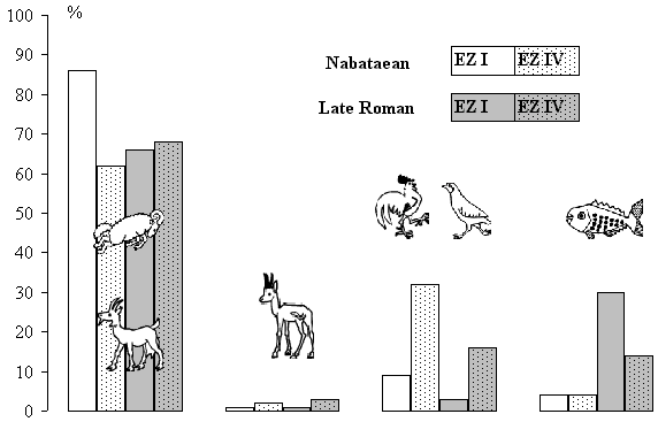

Fig. 3. Relative frequencies of domestic and wild mammals, birds and fish consumed at ez Zantur I and IV (cf. table 1b).

[3] 10 % of the total number of identified bird bones when songbirds are included and 4% when they are not.

Species differences are apparent between terraces (Fig. 3). This can be seen most clearly in the case of the birds. The inhabitants of EZ IV consumed a far greater quantity of birds (Nabataean 32% and Late Roman 16%) than those of EZ I (Nabataean 9% and Late Roman 3%), irrespective of the period of occupation. Despite the fact that the percentages of gazelle consumption are too small to be significant, they show a similar tendency: once again, between the two terraces but not between periods.

The frequency of fish, however, displays the opposite tendency: there are indeed differences between periods. Fish remains are more abundant in the Late Roman than in the Nabataean periods, particularly on EZ I, where the consumption of fish was surprisingly important.

To better understand the major differences in taxa representation shown in Fig.3, fish and birds will be examined in greater detail.

Fish: chronological changes

The increase in fish consumption during the Late Roman period on terrace EZ I needs to be defined by taking into account the more specific chronological division of this period into phases. The Nabataean house on the terrace was destroyed in the early AD 2nd century and was covered almost completely at the beginning of the AD 4th century by two Late Roman houses H1 and H2 (Stucky 1996, Kolb 1996). The destruction of the Roman buildings corresponds to the violent earthquake of AD 363. Several years after this seismic event, between AD 380 and 390, part of house H2 was reoccupied until a second earthquake took place in AD 419, which ended the occupation of the terrace. Thanks to the analysis of the archaeological remains (Bignasca *et al.* 1996) and to the reconstruction of the structures (Kolb 1996, 2001), it was possible to recognise and to precisely date several units on this terrace, and thus, the associated bones.

The frequency of domestic mammals, birds and fish, for the four occupation phases of EZ I is presented in Fig. 4. From the beginning of the 1st century BC until the major earthquake that destroyed the town in AD 363, that is to say, during two Nabataean phases (Nabataean 1 and 2) and the first Late Roman phase (Late Roman I), the proportion between ovicaprines, birds and fish remains unchanged. Sheep and goat are dominant, comprising about 80-90% of the remains, the birds attain frequencies of about 10% while fish bones are rare (maximum 6%). After the earthquake, during the

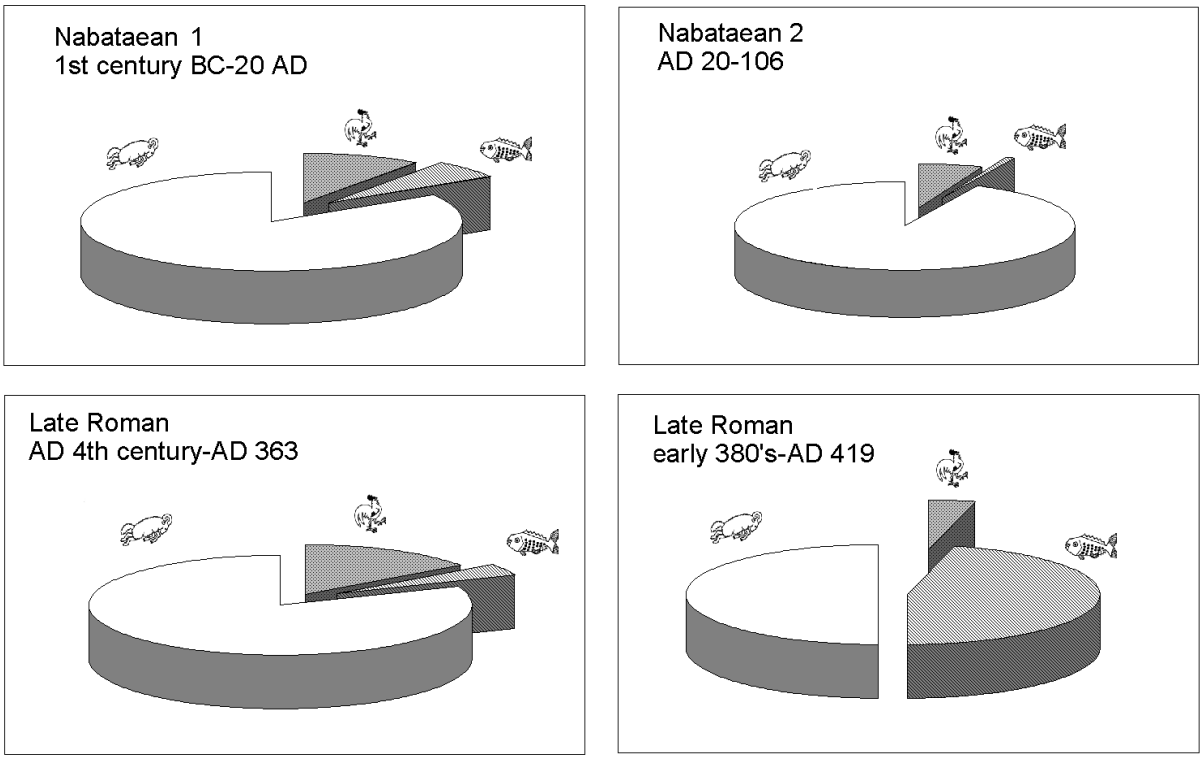

Fig. 4. Ez Zantur I: Chronological changes. Relative frequencies of domestic mammals, birds and fish (cf. table 1c).

second Late Roman phase (Late Roman II), the proportion of fish bones suddenly increased (46%). The predominance of fish does not only characterise one part of the house, but includes the three main rooms occupied at that time. Fish consumption seems therefore to have been characteristic of the diet during the second Late Roman phase.

Trade continued to prosper even after the destruction of a great part of Petra as can be seen by the fish species which have been identified as originating in the Red Sea[4] (Desse-Berset & Studer 1996). However, the great frequency of fish remains in the material collected on EZ I does not necessarily reflect a general change in the diet of the inhabitants of the town. Unfortunately, there is not enough faunal material dated precisely to the Late Roman II phase on the other terraces to make a detailed examination of this trend possible. For the moment, it can only be stated that on terrace EZ I, a marked change occurred in the dietary habits of the inhabitants after the earthquake. This is probably related to the occupation of the house by a new population group. The eventuality of an abrupt increase in trade seems difficult to accept, without an associated increase in other imported products.

Birds: changes in spatial distribution

In the case of the birds, it has been shown that they are more abundant in EZ IV than in EZ I (Fig. 3). A more detailed study of bird remains offers further interesting information. Fig. 5 shows the relative frequency of domestic birds (consisting mainly of chicken and two bones from domestic goose) to wild birds consisting of chukar partridge and Rallidae[5]. It is clear that in both periods, the inhabitants of EZ IV consumed about three times more wild birds than their neighbours on EZ I. When tested using a chi-square test, there is no significant difference in bird consumption between periods on the same terrace, either at EZ I (P= 0.65), or at EZ IV (P= 0.57).

The following question can be asked: is the high frequency of birds compared to mammals and fish on terrace IV (Fig. 3) only due to the increase in the frequency of wild birds? Actually, this is not the case: chickens were also more important at EZ IV than at EZ I. On terrace EZ I, the percentage of domestic birds was 8% in the Nabataean and 3% in the Late Roman Period compared to 25% (Nabataean) and 13% (Late Roman) on terrace EZ IV. Therefore, the examination of the importance of birds in the diet of the inhabitants of ez Zantur shows that not only chicken, but also game birds, were more common in the EZ IV assemblage. As these differences are independent of chronology, they have to be discussed in terms of function and/or the social status of the inhabitants of each terrace. The excavation of terrace EZ IV is not complete, but preliminary results indicate that the architecture of the house, the finds, as well as the location are of a higher status than those of the houses at EZ I. The house of EZ IV is a complex private building, including large representative rooms, water cisterns, a heating system, and a residential section (Kolb and Keller 2000). It was built by the Nabataeans during the AD 1st century and occupied with few modifications by the Late Romans. The

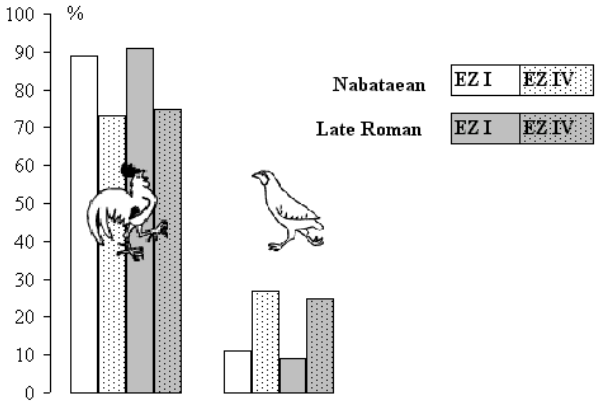

Fig. 5. Relative frequencies of domestic and wild birds consumed at ez Zantur I and IV (cf. table 1d).

[4] Except one fresh water species, *Clarias gariepinus*.
[5] The wild birds consist of 20 identified species, but Chukar and two Rallidae represent the majority of the remains.

same variety and complex organisation of the structures was not found on terrace EZ I. As for the archaeological finds, glass vessels dating to the Late Roman period are more abundant and of better quality on terrace I than on terrace IV (Keller 1998). A similar tendency has been observed within the pottery corpus (Gerber 1998). Therefore, it is proposed that the observed changes in the composition of the diet between the two terraces may be associated with social status. Poultry[6] and game birds were probably more expensive than sheep and goat meat, and can be interpreted as so-called "luxury" foods.

Conclusion

Differences in diet based on the analysis of animal remains from an urban site need to be developed separately for each specific change. With the study of the remains from ez Zantur, it appears that despite a preliminary selection of the assemblages to make their comparison possible, the differences that were recognised had to be analysed separately. In the case of fish consumption, a further subdivision of the two major chronological periods was necessary to clarify the situation. But such phase comparisons were possible only for the assemblage from one terrace. On the second terrace, the number of well-dated bone samples was too small. Better resolution was obtained when examining the rise in consumption of bird remains on one of the terraces, by separating them into domestic and wild species. It would be interesting to further develop this analysis by comparing the relative frequencies of the different species of wild birds (as well as fish species). However, there is currently a problem of quantification, as the number of bones for each species is too small to permit comparison between areas and periods. We hope that by the end of the excavation of ez Zantur, the bone material collected will allow us to complete this analysis.

Apart from chronological and social status, there is a third influence on the diet that has only been briefly mentioned, namely trade. In a city like Petra, a caravan centre, the importance of trade could also have changed over time. Fish consumption would then be a potential indicator, but only when associated with analysis of all the imported items, such as mollusc shells, glass or pottery vessels.

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[6] The case of poultry is ambiguous, because we don't know if some of the chickens may have been kept by the inhabitants (perhaps mainly be for eggs).

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