

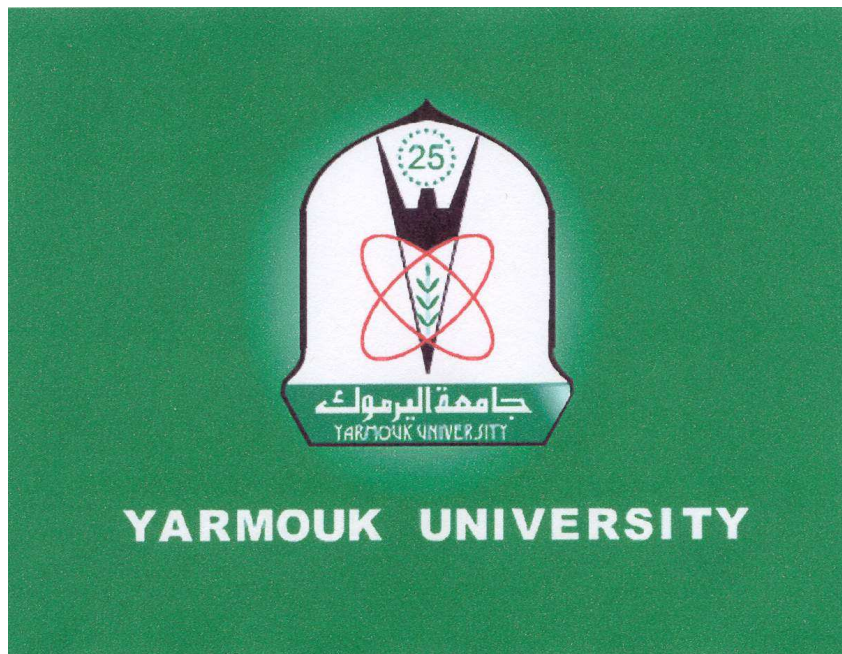
ARCHAEOZOOLOGY OF THE NEAR EAST

V

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H. Buitenhuis, A.M. Choyke, M. Mashkour and A.H. Al-Shiyab



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THE ECONOMIC SIGNIFICANCE OF THE DOMESTIC AND WILD FAUNA IN IRON AGE DEIR'ALLA

Lambert van Es¹

Abstract

Animal remains have been collected since the beginning of the excavations at Tell Deir'Alla in 1960. Ninety percent of the animal remains represent domestic animals. The ovicaprines are the most numerous domestic animal group if we consider NISP. When we look at the weight of the bones of ovicaprines and bovines, we see that cattle provided the inhabitants of Tell Deir'Alla with about 60%, and the ovicaprines with less than 40% of their meat. The highest percentage of wild animals is found in Iron Age phase IIC. The cervids are the most important group of wild animals, followed by gazelle.

Résumé

Depuis le début des fouilles de Tell Deir'Alla en 1960, les restes fauniques ont été systématiquement collectés. Quatre vingt pourcent de ces vestiges appartiennent aux animaux domestiques. Les ovicaprinés sont les animaux les plus représentés si l'on considère le nombre de restes. En revanche, si l'on considère le poids des restes on constate que les bovins constituaient 60% de l'alimentation carnée des occupants du site et les ovicaprinés plus que 40%. Le pourcentage le plus élevé d'animaux sauvages est rencontré à l'Âge du Fer IIC. Les cervidés sont les animaux les plus chassés suivi par la gazelle.

Key Words: Faunal remains, Iron Age, Tell Deir'Alla, Levant, Jordan

Mots Clés: Restes fauniques, Âge du Fer, Tell Deir'Alla, Levant, Jordanie, Archéozoologie

Introduction

The following paper is based on a presentation given at a meeting in honor of Professor H.J. Franken, on the subject of 'Trade and Economy in the Iron Age Levant' held in Leiden, the Netherlands, on the 4th and 5th November 2000. It presents the results of an analysis of almost 9000 animal bones from the Iron Age phases of Tell Deir'Alla in Jordan.

Tell Deir'Alla is a 25 m high tell situated on the eastern side of the river Jordan near where the Wadi Zarqa enters the valley (Van der Kooij & Ibrahim 1989); (Fig. 1). The occupation of Tell Deir'Alla began in the Middle Bronze Age and continued until the Iron Age III, around 330 BC. People continued to live in the surroundings of the tell. In the Mamluk and the early Ottoman periods, the tell was used as a cemetery.

The Iron Age of Deir'Alla is divided into six phases starting with Iron Age IA, about 1200 BC, and ending in the Babylonian-Persian period (Table 1).

Work at Tell Deir'Alla began more than 40 years ago. Since then there have been a succession of excavation seasons, which first were led by Professor Franken of Leiden University, and later, from 1978 onwards, by Dr. Van der Kooij in cooperation with the Department of Antiquities in Amman. In 1980, the Yarmouk University in Irbid joined the team.

Methods

About five years ago, an intensive analysis of the animal remains began. During the excavations at Tell Deir'Alla thousands of bones and bone fragments were collected, and ca 12,000 of these fragments have now been analyzed. No sieving was done during the early years of the excavations. Use was made

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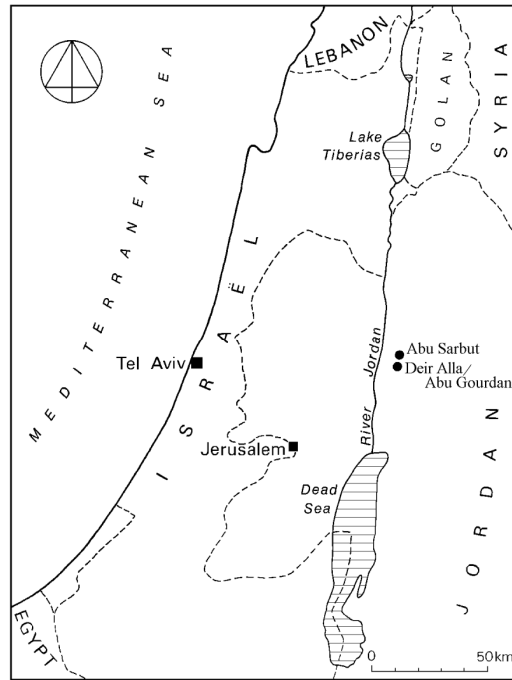


Fig. 1. Map showing the location of Tell Deir' Alla

Table 1. Stratigraphic sequence at Deir 'Alla

Iron Age III - Babylonian-Persian 500-400 BC	
Strata	
II	
III	Buildings
IV	Courtyard accumulation
V	Village; courtyards with many pits for fodder
Iron Age IIC - Neo Assyrian 700-500 BC	
Strata	
VI	Farmhouses with fodder barn and heavy courtyard
VII	Village; wall, destroyed by earthquake and fire
Iron Age IIB 800 BC - religious text 'Balaam text'	
Strata	
VIII	Large building with yard on ruins of IX
IX	Village destroyed by earthquake and fire
	Living compounds with weaving
Iron Age IIA 1000 BC - No osteological remains	
Stratum	
X	Village with solid buildings large storage basement and rubbish-heap.
Iron Age IB 1100 BC	
Stratum	
E-L	Village; rounded tower with wall
Iron Age IA 1200-1100 BC	
Stratum	
A-D	Some houses, large metal ovens;
Seasonal use	storage pits for fuel and fodder.

of the extensive reference collection of the Groningen Institute of Archaeology, the former Biological - Archaeological Institute (BAI). The statistical and database program SPSSPC was used to analyze the data. The faunal remains were identified as close to species level as possible. For the remains that were too fragmented, seven 'size classes' were used (Buitenhuis unpublished). Only domestic and wild mammalian remains are discussed in this short paper. Uncertain identifications as to wild or domestic forms such as with *Sus scrofa* or *Sus domesticus* and *Capra aegagrus* or *Capra hircus* are also excluded. In the text, the cattle *Bos taurus* and *Bos indicus* are grouped together because they are distinguishable only in the thoracic vertebrae (Clason 1978). Any intrusive animals such as small rodents were also not used in the analysis.

The faunal analysis

The Iron Age of Deir'Alla is represented by almost 9000 fragments, of which 78% NISP and 96% by weight could be identified to family or species level (Table 2).

In studying the wild and domestic fauna of Deir'Alla it becomes clear that the inhabitants of Deir'Alla were not dependent on hunting for their meat supply. In all phases of the Iron Age, the percentage of wild animals compared to domestic animals is very low. The highest proportion of wild animals is found in Iron Age IIC with a percentage of 6.9% NISP.

The domestic mammals

As mentioned before, the domestic mammals in all Iron Age phases make up over 90% by NISP and 95% by weight of the faunal remains. From an economic point of view they are the most important group. If we look more closely at the domestic mammals we can distinguish six groups (Fig. 2).

In all phases, the small domestic ruminants, sheep and goat, form over 70% by NISP and almost 40% by weight of the domestic animals. The only exception are Iron Age levels IIA, IIB and IIC, which were only 38,1% by NISP and 21,3% by weight is formed by the small ruminants. Cattle are the second largest group, comprising 25% on average. The equids, horses and donkeys, as well as the pigs and the dromedary only comprise very small percentages. Among the domestic animals dogs form a separate group; they were not eaten, nor were they used as draught animals. They were tolerated, and possibly some were used as watchdogs and hunting dogs. Dogs are found in small numbers, mostly as more or less complete, articulated skeletons.

If we look at domestic mammals as meat providers, it is not enough just to consider the number of bone fragments. Identical numbers of sheep/goat and cattle bones, will not represent the same amount of meat. The weight of the bone fragments stands in a linear correlation with the weight of the meat.



Fig. 2. Relative NISP percentages of the domestic mammals of Tell Deir' Alla.

Table 2a. The NISP of the domestic and wild mammals from the Iron Age phases at Tell Deir'Alla.

<i>Iron Age phases</i>	IA	IB	IIB	IIB/C	IIC	IIC/III	III	IIA/B/C
Domestic mammals								
<i>Canis familiaris</i>	7	3	2	4	1	13	4	2
<i>Sus domesticus</i>	1	3	1	16	1	2	-	3
<i>Equus caballus</i>	-	-	1	5	-	5	-	-
<i>Equus asinus</i>	2	9	-	4	1	7	-	-
<i>Equus spec.</i>	2	1	-	5	4	3	4	2
<i>Camelus dromedarius</i>	-	-	-	1	2	2	-	1
<i>Ovis aries</i>	113	139	6	18	34	112	23	1
<i>Capra hircus</i>	115	139	6	15	16	61	25	4
<i>Ovis aries/Capra hircus</i>	608	1080	131	407	210	1418	146	19
<i>Bos taurus</i>	277	577	45	152	97	403	54	31
<i>Bos indicus</i>	1	3	-	-	1	1	1	-
Subtotal	1126	1954	192	627	367	2027	257	63
Wild mammals								
<i>Sus scrofa</i>	-	1	-	-	1	-	-	-
<i>Vulpes vulpes</i>	-	5	-	-	-	-	-	1
<i>Mustela nivalis</i>	-	1	-	-	-	-	-	-
<i>Vormela peregusna</i>	1	-	-	-	-	-	-	-
<i>Herpestes ichneumon</i>	1	-	-	-	-	-	-	-
Cervidae	3	4	8	3	4	27	4	1
<i>Dama mesopotamica</i>	4	1	1	2	18	69	3	-
<i>Gazella spec.</i>	2	1	-	-	4	10	2	-
<i>Gazella subgutturosa</i>	-	-	-	1	-	4	-	-
Subtotal	11	13	9	6	27	110	9	2
Total	1137	1967	201	633	394	2137	266	65

Table 2b. The weight of the bones of domestic and wild mammals from the Iron Age phases of Tell Deir'Alla.

<i>Iron Age phases</i>	IA	IB	IIB	IIB/C	IIC	IIC/III	III	IIA/B/C
Domestic mammals								
<i>Canis familiaris</i>	10	9	21	30	4	413	145	2
<i>Sus domesticus</i>	1	47	18	208	34	8	-	44
<i>Equus caballus</i>	-	-	86	637	-	118	-	-
<i>Equus asinus</i>	34	475	-	201	21	414	-	-
<i>Equus spec.</i>	36	19	-	62	143	191	1269	24
<i>Camelus dromedarius</i>	-	-	-	2	180	71	-	114
<i>Ovis aries</i>	1439	1894	80	190	1712	1411	388	24
<i>Capra hircus</i>	1399	1808	28	172	123	791	282	46
<i>Ovis aries/Capra hircus</i>	5594	8826	444	2025	1336	7444	811	155
<i>Bos taurus</i>	8440	16985	904	4234	3121	12139	1634	650
<i>Bos indicus</i>	7	20	-	-	11	109	175	-
Subtotal	16960	30183	1581	7261	6685	23109	4704	1059
Wild mammals								
<i>Sus scrofa</i>	-	19	-	-	7	-	-	-
<i>Vulpes vulpes</i>	-	29	-	-	-	-	-	1
<i>Mustela nivalis</i>	-	1	-	-	-	-	-	-
<i>Vormela peregusna</i>	8	-	-	-	-	-	-	-
<i>Herpestes ichneumon</i>	5	-	-	-	-	-	-	-
Cervidae	125	165	72	32	96	622	81	9
<i>Dama mesopotamica</i>	119	10	415	40	539	1922	107	-
<i>Gazella spec.</i>	8	3	-	-	19	222	83	-
<i>Gazella subgutturosa</i>	-	-	-	15	-	50	-	-
Subtotal	265	227	487	87	661	2816	271	10
Total	17225	30310	2068	7848	7346	25925	4975	1069



Fig. 3. Weight percentages of the domestic mammals of Tell Deir'Alla.

A different picture emerges if we look at Figure 3, where the bone weights of domestic mammals are given. It is not the sheep and goat which are the most important meat providers, but rather cattle with over 50% of the bone weight. Pigs do not seem to be important as meat providers. Equids and dromedary also display relatively low percentages in bone weight, but probably neither of these animals were ever, or even sporadically eaten, as only a few bones show cutmarks.

The domestic mammals were used not only to provide the inhabitants with meat. A number of animals may have been exploited in other ways. Cattle could have been used to produce milk, but they were probably also used for ploughing, although not many exostoses on first phalanges have been found to prove heavy labor. The bones of cattle were used to make tools, as the many 'weaving tools' made from cattle ribs show. Sheep and goats may have been milked, and the sheep probably also produced wool.

Dromedary bones do occur for the first time in Iron Age phase IIC around 700 BC, but in very low proportions. They were used as draught animals, and were only rarely used for food. Only a few dromedary bones have butchering marks on them. The scarcity of the dromedary in the Iron Age contrasts with the Islamic periods at Tell Abu Sarbut and the Arabic-Mamluk period at Tell Abu Gourdan where much higher dromedary percentages are found; up to 18.5 % in phase C at Tell Abu Sarbut. At Tell Abu Sarbut, dromedares were probably used as draught animals for the large-scale sugar industry (Van Es 1995).

The wild mammals

When we look more closely at the wild animals (Fig. 4, 5), it becomes clear that deer are the most numerous group. These deer remains are most probably all Mesopotamian fallow deer, *Dama mesopotamica*, as the numerous antlers reveal. These deer are nowadays an almost extinct species, which only occur in a small number of zoos. However, they used to be quite common in wet forests in North Africa and in the Middle East (Grzimek 1968). Besides deer remains, gazelle bones are found in small numbers. These gazelles are most likely to be Goitred gazelle (*Gazella subgutturosa* Gldenstaedt, 1780) (Kingswood & Blank 1996). This species was common in Arabia and Transjordan until the Second World War. There is evidence that these gazelle were caught in stone blinds, called 'desert kites' (Mendelssohn 1974; Vine 1987).

Wild boars were occasionally caught in the Jordan river valley. Four species of carnivore have been found. Of these, the Arabic red fox (*Vulpes vulpes arabica* Linnaeus 1758) is found in two of the Iron Age phases. The other carnivores are the weasel (*Mustela nivalis* Linnaeus 1766), the marbled polecat (*Vormela peregusna* Gldenstaedt 1770), of which an incomplete skeleton was found, and the Egyptian mongoose (*Herpestes ichneumon* Linnaeus 1758).

As in Tell Hesban, the remains of small mustelids were sporadically found during the excavations (Boessneck and von den Driesch 1978). It is unlikely that these animals were used as a food source. More probably, they were used for their skins. Neither the fox remains nor the bones of the small



Fig. 4. NISP percentages of the wild mammals of Tell Deir'Alla.



Fig. 5. Weight percentages of the wild mammals from Tell Deir'Alla.

mustelids or the Egyptian mongoose have cutmarks on them. This makes it doubtful that these animals were skinned.

Conclusion

The Iron Age inhabitants of Tell Deir'Alla had an economy that depended almost entirely on domestic mammals. Cattle were more important as meat producers than the small ruminants sheep and goat. Equids and dromedary are found in small numbers, and were probably kept for traction. Dogs, often young puppies, are present in every Iron Age phase; they occur in small numbers and often, as more or less, complete skeletons.

Deer, which were still present in the surroundings of Tell Deir'Alla, were occasionally hunted. Small carnivores are found in small numbers. Whether these animals were caught for food or for their skins remains unclear, because butchering marks have been found on none of their remains.

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References

- Boessneck J. and A. von den Driesch, 1978. *Preliminary analysis of the animal bones from Tell Hesban*. Andrews University seminary studies Vol. XVI, No.1.
- Buitenhuis H., *Code list for coding to computer use by programs of H. Buitenhuis*. Biologisch-Archaeologisch Instituut, Groningen (unpublished).
- Clason A.T., 1978. Late Bronze Age-Iron Age Zebu Cattle in Jordan? *Journal of Archaeological Science* 5: 91-93.
- Clason A.T. and H. Buitenhuis, 1978. Archeozoologisch onderzoek in het Midden-Oosten. *Spiegel Historiae* Nr. 11: 677-687.
- Corbet G.B., 1978. *The Mammals of the Palaearctic Region*. British Museum (Natural History), Cornell University Press.
- Driesch A. von den, 1976. *A Guide to the Measurement of Animal Bones from Archaeological Sites*. Peabody Museum Bulletin 1, Cambridge, Mass.
- Es L.J.M. van, 1995. Faunal remains from Tell Abu Sarbut, A preliminary report. In: H. Buitenhuis and H.-P. Uerpmann (eds), *Archaeozoology of the Near East II*. Proceedings of the second international symposium on the archaeozoology of southwestern Asia and adjacent areas. Leiden, Backhuys Publishers, The Netherlands, pp. 88-96.
- Es L.J.M. van, 1998. A weasel femur (*Mustela nivalis* Linné 1766) from the Iron Age of Tell Deir'Alla (Jordan). In: H. Buitenhuis, L. Bartosiewicz and A.M. Choyke (eds), *Archaeozoology of the Near East III*. Proceedings of the third international symposium on the archaeozoology of southwestern Asia and adjacent areas. ARC-Publications 18, Groningen, The Netherlands, pp. 117-119.
- Grzimek B., 1968. *Het leven der dieren*. Deel XIII zoogdieren 4.
- Harrison D.L., 1968. *The Mammals of Arabia*. Vol. 2. London, Ernest Benn Limited.
- Kingswood S.C. and D.A. Blank, 1996. *Gazella subgutturosa*. In: *Mammalian species* no. 518: 1-10.
- Van der Kooij, G. and M.M. Ibrahim, 1989. *Picking up the threads...* A continuing review of excavations at Deir'Alla, Jordan. Leiden, University of Leiden, Archaeological Centre.
- Mendelsohn H., 1974. The development of the populations of gazelles in Israel and their behavioural adaptations. *The behavior of ungulates and its relation to management*. Alberta, The University of Calgary, pp. 721-742.
- Vine P., 1987. *Jewels of the kingdom*. London, Immel Publishing, pp. 62-63,