

THE BRONZE AGE AND DACIAN FAUNA FROM NEW EXCAVATIONS AT PECICA “ȘANȚUL MARE”

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Abstract: Recent excavations at Pecica Șanțul Mare from 2006-2009 have produced a large and representative faunal assemblage from Dacian and Bronze Age contexts. In both periods, livestock husbandry was by far the most important source of meat, with hunting and trapping game, fishing, and collecting mollusks contributing secondarily. However, there are significant differences between Iron and Bronze Age animal economies.

Dacian animal husbandry was centered on pig rearing. A substantial number of the pigs were sucklings, suggesting the presence of a relatively specialized, rapid-turnover husbandry system of locally produced meat. Smaller numbers of caprines and cattle were also raised, both being used primarily for meat rather than dairy, wool, or traction. Horses and chickens are infrequent. Few game mammals were consumed but there are a fair number of fish, particularly carp, and many freshwater mussels.

The Bronze Age population at Pecica were similarly reliant on animal husbandry, but were far less focused on a single domesticate. In general, caprines were the most common livestock, followed closely by pigs and cattle. There is no evidence of specialized secondary products production. Large game hunting was more important than in the Iron Age and fishing was less common. Several important changes occurred during the Bronze Age occupation. More high value livestock are being produced in the earlier D/E habitation layers, particularly horses. Through time, smaller-bodied livestock like caprines and pigs become more common, as do low-ranked wild resources.

Introduction

Pecica “Șanțul Mare”, located along the Mureș River in Arad County, Romania, is one of the most important archaeological sites in the Carpathian Basin. It is one of the two Bronze Age settlements used to define the eponymous Periam-Pecica (Maros) culture and its rich deposits have been instrumental in establishing regional chronologies. While much of the site’s deep stratigraphy are Early to Middle Bronze Age, there are important Medieval and Iron Age occupations as well. In particular, the Dacian deposits have received much attention, being the subject of several excavations since the early 1900s.¹

Since 2005, the Bronze Age habitation has been the focus of a collaborative project between the University of Michigan, Muzeul Banatului Timișoara, and Muzeul Județean Arad.² A 10 × 10 m² block was opened in the central

portion of the tell in an area where Crișan’s previous work had removed most of the overlying Iron Age strata. These excavations have uncovered the bases of several large Dacian pits, along with extensive Bronze Age deposits, including houses, hearths, middens, pits, and a large prepared platform. Systematic recovery strategies, utilizing screening and flotation, produced a large quantity and range of materials, including a rich faunal assemblage. To date, over 21,400 fragments of animal bone, antler, and shell have been analyzed from the 2006–2009 campaigns.

This report presents a preliminary assessment of the animal remains left by the Bronze and Iron Age inhabitants of Pecica “Șanțul Mare” (Table 1).³

³ The Pecica “Șanțul Mare” faunal assemblage includes materials from hand collected, screened, and flotation samples. Analysis is on-going and the current report utilizes the large hand collected assemblage, with a 50% sample of general fill deposits and 100% analysis of features. Only material recovered by careful trowel excavation is included. While addition of the screen and flotation samples will no doubt significantly increase the number of small bone fragments in the assemblage, preliminary analysis of this material had found a surprisingly low number of identifiable remains,

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¹ Crișan 1978; Dömötör 1901a, 328; Dömötör 1901b, 327–328; Popescu 1944; Roska 1912.

² O’Shea *et alii*. 2005; O’Shea *et alii*. 2006.

Differences in animal management and consumption practices are highlighted between the Iron and Bronze Age occupations, as well as changes occurring within the later portion of the Bronze Age occupation, specifically between the later B-C layer settlement and the more intensely occupied D-E contexts. A more detailed account of site stratigraphy, dating, and excavation history is presented elsewhere.⁴

Taxon abundance

Patterns of major faunal class representation indicate the relative importance of animal husbandry compared to hunting and trapping game, fishing, and collecting mollusks. In all periods, livestock production is the most important sector of the animal economy, contributing between 52–66% of the faunal remains identifiable to family or better (Figure 1). While freshwater mussels are the next most common numerically, they certainly contributed only a minor portion of the diet given the small amount of meat per individual. Shells can also be used as flux in smelting or for lime production, so it cannot be assumed that the mollusk remains were solely food debris. Game mammals, predominantly red deer, were the second largest meat source behind domesticates. Other important large game species are roe deer, boar, and aurochs. A variety of fur-bearing animals are also present in small numbers. Fish (mostly carp family), birds, and turtles were relatively infrequent additions to the diet.

Overall, relative taxon abundance is similar between periods, but there are several significant differences as well. Domesticates occur in roughly the same proportions in Iron and Bronze Age contexts on the whole, although there are relatively fewer livestock compared to wild resources in the later Bronze Age layers (B-C contexts). When mollusk harvesting is excluded, the differences in the proportion of wild versus managed animals are only minimal. The most striking temporal changes actually occur in the importance of hunting compared to fishing. In the Dacian deposits, fish are nearly three times as common as in the Bronze Age, varying inversely with the number of wild mammals. Most of the Bronze Age bird remains are probably waterfowl while

domestic chicken is present in the Dacian material. Turtle bone was recovered from only the Bronze Age B and C layers.

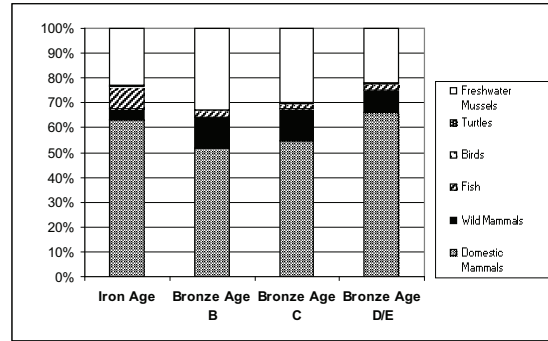


Figure 1: Relative abundance of major taxon classes between periods.

Representation of different livestock species in the refuse is a direct measure of which animals were consumed most frequently. It is also an indirect indicator of animal husbandry practices in terms of respective herd sizes and the amount of resources allocated in their maintenance. Importantly, cattle and especially horses are more expensive to maintain than sheep, goats, or pigs as they require higher quality and a greater quantity of fodder, and they mature and reproduce more slowly. Secondary products, such as dairy, wool, and traction, may also be important resources, affecting herd proportions. It is assumed here that the majority of animals consumed at Pecica were raised by site inhabitants, although exchange of animals and their products from neighboring settlements most likely occurred as well.

There are fundamental changes in livestock management strategies between periods (Figure 2). In the Dacian features, pigs are by far the most common animal, comprising almost 80% of the domesticate bones. Smaller numbers of sheep/goat and cattle are present and horse bones are rare. An emphasis on pig husbandry is associated with specialized meat production due to their rapid maturation, reproduction, and high meat and fat yields.⁵ In contrast, caprines, pigs, and cattle are consumed in more equal proportions during the Bronze Age (caprines 31–42%, pigs 26–36%, cattle 18–20%). Importantly, there is major decrease in the frequency of horses in the later Bronze Age deposits, falling dramatically from 25% to 4% of the livestock between the D/E through B occupations. A greater emphasis is instead placed on smaller bodied livestock,

including fish and smaller mammalian bones. As a result, the hand collected assemblage has an efficient recovery rate and is taken to be largely representative. Note also that the material from the platform feature (layer D0) is considered separately given the uncertain origin of its redeposited contents.

⁴ O'Shea *et alii* 2011.

⁵ Zeder 1991.

especially pigs. This trend continues into the Iron Age where horses comprise less than 2% of the domesticates.

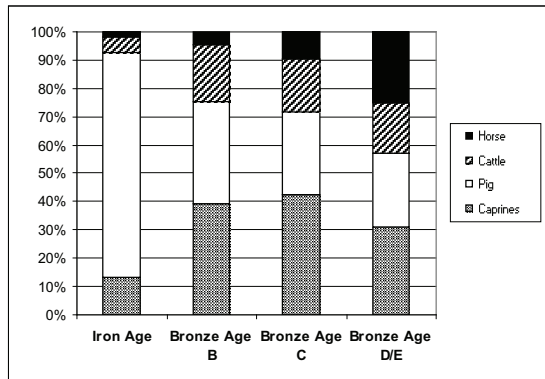


Figure 2: Livestock proportions between periods.

Livestock Culling Patterns

Livestock culling practices, combined with taxon representation, provide a more nuanced understanding of animal management and consumption. Culling practices respond to a variety of factors (e.g., resource stress, herd security, taste preferences, provisioning, specialized production) and are useful for assessing larger issues surrounding economic organization. In this study, given the high level of destructive carnivore gnawing, age-at-death profiles utilize dental data only.

Caprines⁶ show little difference in mortality patterns between periods. The largest off-take consistently occurs with prime-aged subadults (1.5–3 years). This pattern reflects a meat maximization strategy rather than specialized production of secondary products (milk or wool) or a central concern with herd security.⁷ In contrast, pigs are being managed very differently between the Iron and Bronze Ages. Bronze Age pigs show a common pig mortality profile for this fecund species. The majority of animals are culled in the fall/winter of their first year and very few animals beyond three years are maintained for breeding. The Dacian materials shows that far more infant pigs, especially neonates, are being consumed in the Iron Age.⁸ Suckling pigs historically are viewed

⁶ Caprines (sheep and goats) must be analyzed together since their bones are often difficult to distinguish, especially when highly fragmented, as in this sample. There are no confirmed goat bones in the Iron Age features and around 80% of the identifiable caprines are sheep in Bronze Age deposits. Goat bones tend to skew the mixed caprine age profile towards younger animals since they are only used for meat or milk.

⁷ Marom and Bar-Oz 2009; Payne 1973; Redding 1981.

⁸ While a high proportion of neonatal animals can be ambiguous, in this case the pattern is unlikely to reflect

as high value given their very tender, but small quantity of meat.⁹ They will also be consumed in high numbers in situations where they are being raised and consumed locally and there is need to minimize labor and fodder requirements in meat production.¹⁰ This pattern is often seen in urban and special-purpose sites like military outposts or castles.¹¹ Meat-maximization or herd security is not a priority in any period, as most of the pigs have not attained full body weight nor reproductive age.

There are far fewer ageable elements for cattle and horses, particularly in Dacian contexts. Little can be said about cattle husbandry in any period, except that there is no evidence of specialized dairy production. While cattle were most likely used for milk and traction to some degree, meat was their primary resource, as seen with the caprines and pigs. The Dacian horse sample size is insufficient to comment on their breeding or use. However, there is a considerable collection of ageable Bronze Age horses. In the B and C occupations, horses are relatively uncommon and show a profile for small-scale horse breeding and local use, where very young (natural mortality) and older animals are most common. Few prime-aged animals were killed¹² and a number of horses were worked well into old-age. The mortality pattern is very different in the D/E contexts. Here, while there is also evidence of local breeding, there are far more prime-aged animals (4–10 years) than in later periods, more than would be expected for a natural mortality rate.

Butchery Patterns

Detailed discussion of butchery practices and body part representation is beyond the scope of this paper, but a few general statements about Iron Age versus Bronze Age patterns can be made. In all periods, density mediated attrition is evident, with the most fragile elements being under-represented, which is expected given the intensity of occupation at Pecica. However, the lowest quality

resource stress. They are found in most of the Dacian features, and because they span several hundred years, an unusually high infant mortality rate (>10–15%) or emergency herd slaughter is not likely to occur for such an extended period of time.

⁹ Ervynck *et al.* 2003.

¹⁰ Redding 1991.

¹¹ Ervynck 1997.

¹² The Bronze Age horses are likely being eaten as their bones show evidence of burning at a comparable rate to other livestock and show more frequent butchery marks. However, it is unclear what proportion were consumed after natural death versus intentional slaughter for food.

elements, namely the extremities, are consistently under-represented as well, indicating that much of the primary butchery took place away from the central habitation area. There is minimal difference in the proportion of higher and lower quality body parts between periods.

The most significant contrast in animal processing reflects the use of heavy iron tools in the Dacian period. Only 0.4% of the Bronze Age mammalian bone shows cut or chop marks compared to 5.4% in the Iron Age (over ten times as many). Further, Bronze Age butchery marks tend to be restricted to shallow cuts near the epiphyses. The Dacian bone shows much more damage, often cutting through the bone itself rather than connective tissue. Notably, in Feature 2, the body of one pig was halved, with the cervical and lumbar vertebrae chopped through the middle of their centra, while the thorax was split along the adjacent ribs.

Discussion

The Dacian animal economy was centered around livestock production, especially pig rearing. A substantial number of the pigs were sucklings, suggesting the presence of a relatively specialized, rapid-turnover husbandry system of locally produced meat. This may reflect either the relatively high status of the inhabitants, having preferential access to quality pork, or the need to minimize investment costs in meat production, as seen at special purpose, largely non-agricultural sites or urban centers. Small numbers of caprines (mostly or all sheep) and cattle were also raised, both being used primarily (but not exclusively) for meat rather than dairy, wool, or traction. A few horses were present, but it is unclear whether they were eaten as they

are only represented by a few isolated teeth. Bones from a single chicken were recovered from Feature 2. Wild resources were a minor component of the diet. Only a few game mammals were consumed but there are a fair number of fish, particularly carp, and many freshwater mussels.

The Bronze Age population at Pecica were similarly reliant on animal husbandry, but were far less focused on a single domesticate. In general, caprines were the most common livestock, followed closely by pigs and cattle. As in the Dacian period, there is no evidence of specialized secondary products production. A wide variety of wild animals were utilized, from turtles to aurochs, but red deer were the most frequent hunted animal. Fishing was less important than in the Iron Age.

There are significant changes in the animal economy during the Bronze Age occupation. There are far more high value livestock being produced in the earlier D/E layers, particularly horses. Through time, smaller-bodied livestock like caprines and pigs become more common, as do mussels and other low-ranked wild resources. There is some suggestion of more tightly scheduled off-take of animals in the D/E occupation, which may be related to greater centralization of animal production. A much larger proportion of prime aged horses are being consumed at the same time.

While important temporal patterns have been identified in this preliminary work, further examination of the faunal remains from Pecica Șanțul Mare will better define animal production strategies and consumption patterns at this key settlement. This, in conjunction with other aspects of social and economic organization, will allow a greater understanding of Pecica's regional role both in the Iron and Bronze Ages.

Table 1. *Pecica Şanţul Mare Fauna by Period (NISP)*

Common Name	Taxon	Iron Age	Bronze Age B	Bronze Age C	Bronze Age D/E	Platform	Bronze Age Total	Site Total*
Sheep/Goat	Ovicapridae	44	151	571	245	150	1117	1161
Sheep	<i>Ovis aries</i>	3	12	24	24	8	68	71
Goat	<i>Capra hircus</i>			13	4	3	20	20
Pig	<i>Sus scrofa</i>	286	149	413	227	124	913	1199
Cattle	<i>Bos taurus</i>	19	83	271	153	115	622	641
Horse	<i>Equus caballus</i>	7	18	136	221	55	430	437
Dog	<i>Canis familiaris</i>	3	18	27	16	7	68	71
DOMESTIC MAMMAL		362	431	1455	890	462	3238	3600
Red Deer	<i>Cervus elaphus</i>	19	84	241	102	73	500	519
Roe Deer	<i>Capreolus capreolus</i>	2	5	40	6	8	59	61
Wild Boar	<i>Sus ferus</i>	2	3	14	6	3	26	28
Beaver	<i>Castor fiber</i>		3	10	2		15	15
Aurochs	<i>Bos primigenius</i>		1	10	3		14	14
Badger	<i>Meles meles</i>			8	1		9	9
Fox	<i>Vulpes vulpes</i>		4	4		1	9	9
Hare	<i>Lepus europaeus</i>	2	3	3		1	7	9
Small Carnivore (indet.)	Carnivora			1	4		5	5
Wolf	<i>Canis lupus</i>		2	2			4	4
Polecat	<i>Mustela putorius</i>			1			1	1
WILD MAMMAL		25	105	334	124	86	649	674
SMALL RODENT	Rodentia			18	2		20	20
Large Artiodactyl	Artiodactyla	22	40	57	1		98	120
Medium Artiodactyl	Artiodactyla	16	27	29	56		112	128
Large Mammal	Mammalia	397	602	1484	1128	786	4000	4397
Medium Mammal	Mammalia	1181	622	1535	624	473	3254	4435
Small Mammal	Mammalia	24	3	25	18	9	55	79
Mammal (indet.)	Mammalia	235	65	281	113	104	563	798
MAMMAL (INDET.)		1875	1359	3411	1940	1372	8082	9957
Common Carp	<i>Cyprinus carpio</i>	22	16	29	10	1	56	78
Large Cyprinid	Cyprinidae			6	20	1	27	27
Small Cyprinid	Cyprinidae			2	0		2	2
Cyprinid (indet.)	Cyprinidae	27	4	9	1		14	41
Wels	<i>Siluris glanis</i>		4	12	2		18	18
Pike	<i>Esox lucius</i>	1		2			2	3
Medium Fish (indet.)	Pisces	7	2	14	8		24	31
Large Fish (indet.)	Pisces			8			8	8
Fish (indet.)	Pisces	43	11	1	3		15	58
FISH		100	37	83	44	2	166	266
Medium Bird (indet.)	Aves	1		6	4	1	11	12
Large Bird (indet.)	Aves			3	3	1	7	7
Domestic Chicken	<i>Gallus gallus</i>	4						4
BIRD		5		9	7	2	18	23
TURTLE	<i>Emys orbicularis</i>		1	7			8	8
Freshwater Mussel	<i>Unio spp.</i>	130	275	787	293	290	1645	1775
Roman Snail	<i>Helix pomatia</i>				132	3	135	135
Viennese Banded Snail	<i>Cepaea vindobonensis</i>	30	16	23	63	31	133	163
Helicid Snail	Helicidae	7	8	36			44	51
Planorbid Snail	Planorbidae	1			1		1	2
MOLLUSK		168	299	846	489	324	1958	2126
TOTAL		2535	2232	6163	3496	2248	14139	16674

*Excludes Medieval, disturbed, and off-tell contexts

BIBLIOGRAPHY

- Crișan 1978
I. H. Crișan, *Ziridava: Săpăturile de la "Șanțul Mare" din anii 1960, 1961, 1962, 1964*, Arad, (1978).
- Dömötör 1901a
L. Dömötör, Jelentés a pécskai illetve német-peregi ásatásokról. *ArchÉrt*, (1901), 328.
- Dömötör 1901b
L. Dömötör, Római korbelt edények a pécskai Nagy-sáncban. *ArchÉrt*, 327–328.
- Ervynck 1997
A. Ervynck, Detailed Recording of Tooth Wear (Grant, 1982) as an Evaluation of the Seasonal Slaughter of Pigs? Examples from Medieval Sites in Belgium. *Archaeofauna* 6 (1997), 67–79.
- Ervynck *et alii* 2003
Ervynck, A., W. van Neer, H. Hüster-Plogmann and J. Schibler, Beyond affluence: the zooarchaeology of luxury. *World Archaeology* 34 (2003), 428–441.
- Marom – Bar-Oz 2009
Marom, N. – G. Bar-Oz, Culling Profiles: The Indeterminacy of Archaeozoological Data to Survivorship Curve Modeling of Sheep and Goat Herd Maintenance Strategies. *Journal of Archaeological Science* 36 (2009), 1184–1187.
- O’Shea *et alii* 2005
O’Shea, J., A. W. Barker, S. Sherwood and A. Szentmiklosi, New Archaeological Investigations at Pecica Santul Mare. *AnB*, S. N., Istorie-Arheologie, XII–XIII (2005), 81–109.
- O’Shea *et alii* 2011
O’Shea, J., Archaeological Investigations at Pecica “Șanțul Mare” 2006–2009. *AnB*, S. N., Istorie-Arheologie, XIX, (2011).
- O’Shea *et alii* 2006
O’Shea, J., A. W. Barker, A. Nicodemus, S. Sherwood and A. Szentmiklosi, Archaeological Investigations at Pecica Santul Mare: The 2006 Campaign. *AnB*, S. N., Istorie- Arheologie, XIV, (2006), 1, 211–228.
- Payne 1973
Payne, S., Kill-Off Patterns in Sheep and Goats: The Mandibles from Aşvan Kale. *Anatolian Studies* 23, (1973), 281–303.
- Popescu 1944
Popescu D., Celții în Transilvania. *Transilvania* 8–9, (1944), 646.
- Redding 1981
Redding, R. W., *Decision Making in Subsistence Herding of Sheep and Goats in the Middle East*. Dissertation, Department of Anthropology, University of Michigan (1981).
- Redding 1991
Redding, R. W., The role of the pig in the subsistence system of ancient Egypt: a parable on the potential of faunal data. In *Animal Use and Culture Change*, edited by P. J. Crabtree and K. Ryan, 20–30. MASCA, University of Pennsylvania, Philadelphia (1991).
- Roska 1912
Roska, M., Ásatás a Pécska-Szemlaki Határban levő Nagysánczon. *DolgCluj* 3, (1912), 1–73.
- Zeder 1991
Zeder, M. A., *Feeding Cities: Specialized Animal Economy in the Ancient Near East*. Smithsonian Institution Press, Washington DC (1991).