

FAUNAL DETERMINATIONS FROM THE DACIAN FORTRESS IN JIGODIN

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Abstract: The archaeological excavations in Jigodin were performed on the spot called “Câmpul Morii” during 1980–1988 and 1998–2006. The analysed faunal material does not consist of numerous items. I have determined 254 bone remains belonging to species commonly encountered in Dacian settlements (Table 1). Several fragments were found in three complexes (Fig. 1). The blacksmith’s dwelling has revealed the most numerous fauna remains from cattle, caprovid and swine. The bone material from the other two dwellings is practically insignificant. Domestic species represent 99.56% of all remains considering the number of items and 97.29% considering the minimum number of individuals from the entire determined lot. Wild species only feature sporadically. A single fragment was attributed to a red deer. Similarly, domestic fowl are represented by a single hen tibia. Domestic cattle form the majority based on the number of remains, with a frequency of 45.69%. Domestic swine came second, with a percentage of 28.44%. Caprovid, represented by both genera (sheep and goat) reach 15.95%. Horse remains represent 6.03% of the identified material and dog remains represent 3.01%. From the perspective of the minimum number of individuals, swine were the most numerous, with 37.84%, followed by small horned animals, with 27.03% and very closely by large horned animals, with 24.32%.

Keywords: archaeozoology; bones; La Tène; Dacian; Jigodin.

Rezumat: Săpăturile arheologice de la Jigodin au fost efectuate în punctul „Câmpul Morii” între anii 1980–1988 și 1998–2006. Materialul faunistic analizat este redus numeric. Au fost determinate 254 resturi osoase aparținând unor specii întâlnite în mod obișnuit în așezările dacice (Tabel 1). Câteva fragmente provin din trei complexe (Fig. 1). Locuința „fierarului” a furnizat cele mai multe resturi faunistice provenite de la bovine, ovicaprine și suine. Materialul osos din celelalte două locuințe este practic neglijabil. Speciile domestice reprezintă 99.56% după numărul de resturi și 97.29% după numărul minim de indivizi din totalitatea materialului determinat. Speciile sălbatice apar sporadic. Un singur fragment a fost atribuit cerbului. La fel și păsările domestice care sunt prezente printr-o tibie atribuită găinii. Bovinele domestice sunt majoritare sub raportul numărului de resturi, frecvența acestora fiind de 45.69%. Cu un procentaj de 28.44% suinele domestice ocupă locul secund. Ovicaprinele, reprezentate prin ambele genuri (oaie și capră), înregistrează 15.95%. Calului îi revine 6.03% din materialul identificat, iar câinelui 3.01%. Din punct de vedere al numărului minim de indivizi ponderea o dețin porci-nele, cu 37.84%, urmate de cornutele mici, 27.03% și foarte aproape de cornutele mari, 24.32%.

Cuvinte cheie: arheozoologie; oase; La Tène; dacic; Jigodin.

The Dacian settlement in Jigodin is located in Harghita County, on the right bank of River Olt, in the eastern part of that branch of Harghita Mountains that delimitates Ciucului Depression. Archaeological excavations were performed on the spot of “Câmpul Morii”¹. The analysed faunal material was uncovered during archaeological

¹ Crișan 2000, 45–48.

excavations performed between 1980–1988² and 1998–2006³. The Dacian fortress “Jigodin I”, which provided the archaeozoological material analysed here, is dated to the 1st century BC – the 1st century AD⁴. The lot of bones is not very numerous. I have determined 254 bone remains from species commonly encountered in the Dacian settlements.

Species	Culture layer	Blacksmiths' dwelling trench 17-18 1984	Dwelling trench 12 1984	Dwelling trench 1 1998	Total			
					NR	%	MNI	%
<i>Bos taurus</i>	102	3		1	106	45.69	9	24.32
<i>Sus scrofa domesticus</i>	59	6	1		66	28.44	14	37.84
<i>Ovis aries</i> / <i>Capra hircus</i>	31	5		1	37	15.95	10	27.03
<i>Equus caballus</i>	13	1			14	6.03	1	2.7
<i>Canis familiaris</i>	7				7	3.01	1	2.7
<i>Gallus gallus domestica</i>	1				1	0.44	1	2.7
Domestic species	213	15	1	2	231	99.56	36	97.29
<i>Cervus elaphus</i>	1				1	0.44	1	2.7
Wild species	1				1	0.44	1	2.7
Total determined remains	214	15	1	2	232	100	37	100
Ribs of large-size animals	8	3			11			
Ribs of small-average-size animals	6	5			11			
Total	228	23	1	2	254		37	

Table 1. Material distribution according to species⁵.

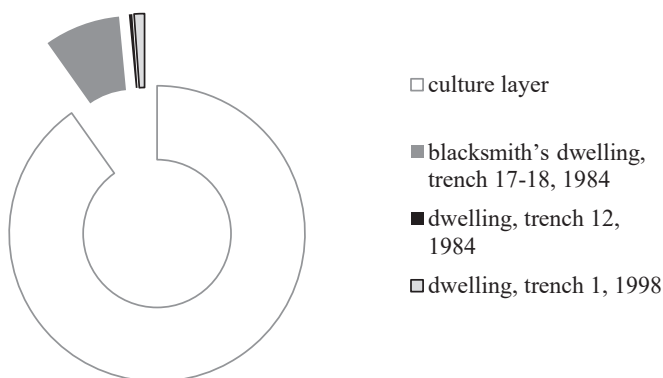


Fig. 1. Distribution of the faunal material according to complexes / culture layer.

² The team was coordinated by dr. Petre Roman.

³ The team was coordinated by dr. Viorica Crișan, whom I thank for the faunal material she has entrusted me for archaeozoological analysis.

⁴ Crișan, Gheorghiu, Popescu 2004, 117.

⁵ NR = number of faunal remains; MNI = minimum number of individuals.

The majority of bone remains were discovered inside the culture layer. Several fragments were found in three complexes (Tabel 1; Fig. 1). The “blacksmith’s” dwelling has revealed the most numerous faunal remains from cattle, caprovid and swine. The bone material from the other two dwellings is in fact insignificant.

I. Presentation of the material from the culture layer

1. *Bos taurus* (cattle)

In the culture layer 102 bone remains from domestic cattle have been identified. The distribution of these fragments according to anatomical elements is balanced. The large number of teeth and their strong chipping irrelevantly increase this anatomical category. The minimum number of estimated individuals is 6, one in each age group category⁶: under 1 year; 1–1½ years; 1½–2 years; 3–3½ years; 4–4½ years; 4½–5 years. Such a distribution suggests the fact that the population exploited domestic cattle both for meat and secondary products, while some of the animals also ensured reproduction.

On the basis of an entire metacarpus I was able to estimate the gender and size of an adult individual. The indicators calculated (cf. Matolcsi index, 1970)⁷ on the basis of the sampled metric data show a female individual measuring 113.6 cm in height at the shoulders.

One proximal metapodium fragment was mostly burnt to black.

2. *Sus scrofa domesticus* (swine)

Domestic swine, holding a significant proportion in the culture layer and consisting of 59 bone remains, are mostly represented by jaw fragments and isolated teeth. The jaw and maxilla with *in situ* dentition are the main indicators of the age when the animals had been sacrificed (through tooth eruption and wear) and have allowed for the estimation of a highest number of individuals as compared to cattle. The 10 estimated swine individuals were sacrificed under 1 year (3 individuals at 2–3 months, 7–8 months and 9–12 months, respectively), at 1½–2 years (3 individuals), at 2–2½ years (2 individuals), at 2½–3 years (1 individual) and at 3½–4 years (1 individual, probably male).

Also, on the basis of the morphology of the canine or isolated teeth I have noted a possible preponderance of male individuals.

Swine metapodia have provided extra pieces of information. Thus, one entire metacarpus IV has indicated a height at the shoulders of 70.66 cm (cf. Teichert index, 1990)⁸. Another metacarpus III had been processed, through polishing, on the cranial facet, stronger towards the proximal extremity, where four transversal cuts have also been performed. Another metapodium, from an individual sacrificed at less than 2 years of age (nonepiphyseal distal) has been polished in the proximal half of the diaphysis.

⁶ Silver 1963, 252–253.

⁷ Udrescu, Bejenaru, Hrișcu 1999, 79.

⁸ Udrescu, Bejenaru, Hrișcu 1999, 86.

3. *Ovis aries* / *Capra hircus* (caprovid)

The faunal material belonging to caprovid, though less numerous (31 fragments), is well represented from the perspective of the minimum number of individuals. The 6 individuals were sacrificed at the following ages: 6 months - 1 year (1 individual), 1-1½ years (1 individual), 1½-2 years (1 individual), and over 3 years (3 individuals). The species could be identified in the case of bones pertaining to adult individuals. Thus two entire metacarpal bones belonged to sheep (2 individuals), and two welded bones, cubitus and radius, were attribute to a goat⁹.

The two entire *Ovis aries* metacarpal bones have provided two values for the size of the sheep in Jigodin: 54.91 cm and 65.13 cm (cf. Teichert index, 1975)¹⁰.

One distal radius fragment displayed traces of burning.

4. *Equus caballus* (horse)

13 faunal remains discovered in the culture layer have been attributed to this species and they apparently belonged to the same individual, dead older than 3½ years.

5. *Canis familiaris* (dog)

Remains from the skull and neck area of a dog (the first two atypical vertebrae - atlas and axis) were also found. The body of the axis is ossified and osteophytes, measuring ca. 5 mm, had developed on the inner side of the caudal articular surface (Pl. I/2). Such osteophytes feature preponderantly in senile individuals and indicate a sub-pathological state with possible symptoms that would have had a negative impact on the animal's mobility.

The skull is fragmentarily preserved, consisting of fragments from the parietal, temporal and occipital regions. The following measurements¹¹ could be taken of the discovered item:

Greatest breadth of the foramen magnum = 17.8 mm

Greatest breadth of the occipital condyles = 35.5 mm

Height of the foramen magnum = 17.4 mm

Height of the occipital triangle = 42.5 mm

Greatest neurocranium breadth (Greatest breadth of the braincase) = 61.1 mm

Greatest mastoid breadth (Greatest breadth of the occipital triangle) = 66.2 mm

Skull height = 50 mm

I have also attributed to dogs three rib fragments that can be determined (with the proximal extremity present), with the costal tuberosity detached from the articular head.

6. *Gallus gallus domestica* (domestic hen)

Birds are represented in the faunal sample by an entire tibia attributed to a domestic hen. The item had the following metric values: maximal length 114.9 mm; proximal width 16.8 mm; diaphysis minimal width 8 mm and distal width 11.4 mm.

⁹ Boessneck, Muller, Teichert 1964.

¹⁰ Udrescu, Bejenaru, Hrișcu 1999, 97.

¹¹ Driesch 1976, 42-45.

7. *Cervus elaphus* (red deer)

The only bone fragment from a wild animal identified in the archaeozoological sample is a proximal radius from a deer that was older than 18 month at the time it was hunted.

One notes two other bone fragments with traces of human intervention, that could not be identified specifically, discovered inside the culture layer. The diaphysis of a long bone from an average-size animal (of the caprovid type) show polished areas (item length – 54.2 mm) and another fragment, probably from the diaphysis of a large animal, was burned, with calcined areas.

II. Presentation of the material from the dwellings

1. Dwelling – trench 17-18 (1984)

This complex, also called “the blacksmith’s dwelling”, has revealed 23 faunal remains attributed to domestic species (Tabel 1). The number of individuals estimated for each species inside this dwelling is large by comparison to the number of corresponding remains.

Cattle are represented by 3 fragments from a juvenile individual (one very small metacarpus) and an adult. Swine are represented by 6 fragments from 3 individuals sacrificed at 1-1½ years, 2-2½ years (female) and one mature individual. From the latter I have identified one mandibular fragment with sub-pathological modifications (Pl. I/1). In the alveoli the fragment preserves the premolars and molar 3 with unequal, oblique wear down to the level of the roots that are partially uncovered on the inner side. The bone tissue on the outer side, by cuspid 3, has been destroyed, resulting in a deep excavation. One possible cause is periodontitis accompanied by a tooth abscess that had prevented mastication, leading to pathological deformities and wear. I have attributed to caprovid 5 remains from 3 individuals: one juvenile, aged 4-5 months, one sheep and one goat older than 1 year. A single fragment was attributed to a horse.

2. Dwelling – trench 12 (1984)

Only two bone fragments were found in this dwelling: one distal nonepiphyseal swine metapodium and a diaphysis remain from a large size animal (undetermined species).

3. Dwelling – trench 1 (1998)

Two remains have been determined, belonging to two species (besides several unidentified flakes): one fragmentary cattle coxa and one isolated inferior molar 3 from an adult caprovid.

III. Synthesis of archaeozoological data. Conclusions

Domestic species represent 99.56% according to the number of remains and 97.29% according to the minimum number of individuals out of the entire determined

material. Wild species feature sporadically. A single fragment was attributed to red deer. Similarly, domestic birds are present in the analysed lot through a tibia attributed to a hen. Domestic cattle are majoritarian from the perspective of the number of remains and their frequency is 45.69%. With a percentage of 28.44% domestic swine held the second place. Caprovid represented by both genera (sheep and goat) represent 15.95%. Horse bone remains represent 6.03% of the identified material and dog bone remains represent 3.01%. From the perspective of the minimum number of individuals, swine hold the highest percentage, 37.84%, followed by small horned animals 27.03% and very closely by large horned animals 24.32%.

This distribution reveals the fact that the local communities were oriented towards animal husbandry, while hunting was negligible. The species are those common in the Dacian settlements from south-eastern Transylvania and their proportion, according to the number of identified remains, is also very similar (Figs. 2–3). Thus, by comparing the lot under discussion here with the archaeozoological samples analysed from the neighbouring sites of Merești¹² (dating: the end of the 1st century BC – the 1st century AD; faunal sample – 659 determined bones) and Covasna¹³ (dating: the 1st century BC – the 1st century AD; faunal sample – 879 determined bones) one notes very small differences among the percentages of domestic mammals used for food. Furthermore, according to the minimum number of individuals, swine held the first position on all three sites under consideration.

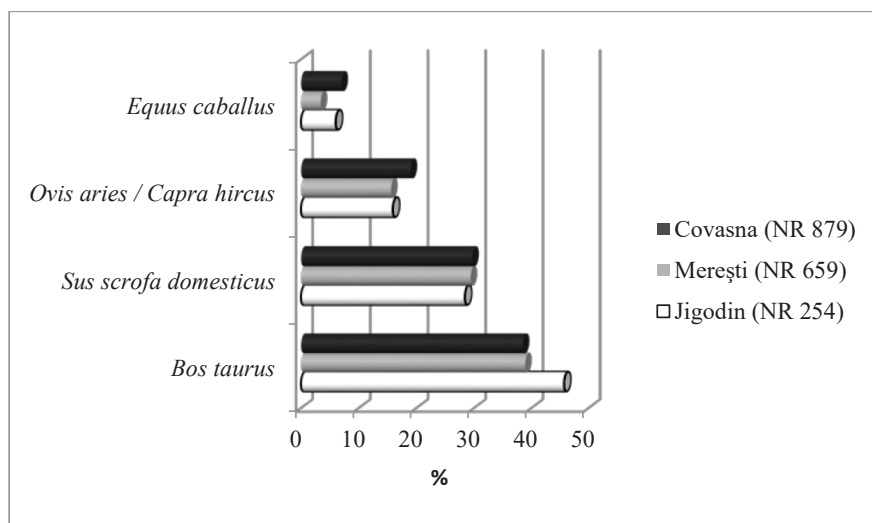


Fig. 2. Proportion of domestic mammals in Dacian settlements from south-eastern Transylvania (considering the number of remains).

One notes differences among the proportions of hunting in the three settlements. Thus, while hunting almost did not exist in Jigodin, in Covasna wild species represent 5.01% and in Merești 12.45%.

¹² Bindea 1999, 83.

¹³ Bindea 2005, 182.

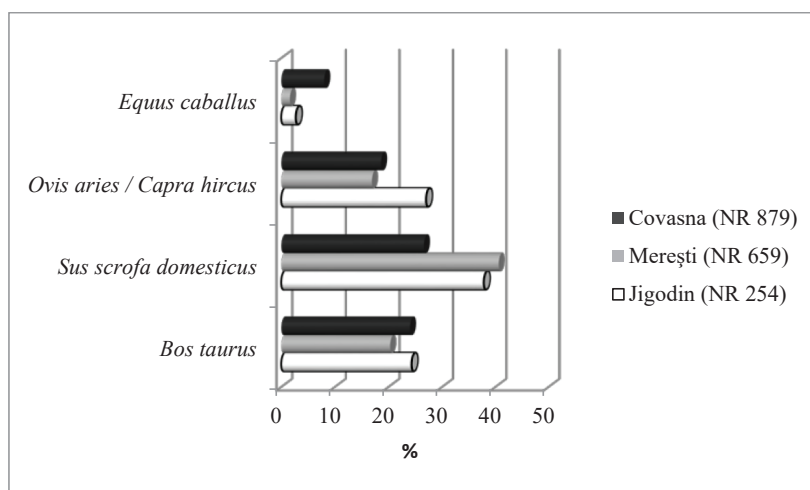


Fig. 3. Proportion of domestic mammals in Dacian settlements from south-eastern Transylvania (considering the minimum number of individuals).

Osteometric data¹⁴ (Annex) have provided information on the size of some of the items sacrificed in Jigodin. The height of a *Bos taurus* female has been estimated to 113.6 cm at the shoulders. This value is relatively high for cattle during the Dacian period that are at the lower limit of the variability interval even for the cattle raised by the Romans. It is important to mention the fact that archaeozoological analyses for the Roman period show an induced increase in the size of bovines, on average with 20 cm, leading to a significant increase in the meat they provided¹⁵. It was not possible to estimate the female individuals from Covasna and Merești; the three values – 105 cm (Covasna), 117.2 cm (Covasna) and 123 cm (Merești) – correspond to a male individual and two castrated males.

Two sizes have been estimated for the sheep in Jigodin: 54.91 cm and 65.13 cm. These values are at the extremes of the variability intervals established for the settlements in Merești – 56.47–66.9 cm – and Covasna – 55.11–63.15 cm¹⁶.

The only value estimated for the size of the swine in Jigodin is 70.66 cm. It matches the variability intervals from Covasna (66.74–77.1 cm) and Merești (66.74–74.25 cm)¹⁷.

The indices used to calculate the height at withers, in the case of Jigodin, Merești and Covasna, were: for bovines, the indices of Matolcsi (1970)¹⁸; for sheep, the indices of Teichert (1975)¹⁹ and for pig, the indices of Teichert (1990)²⁰.

Dental-osseous pathology is rarely identified in archaeozoological samples. It is thus remarkable that four items with sub-pathological modifications have been identified in all three Dacian sites from south-eastern Transylvania: Jigodin, Merești²¹ and

¹⁴ Driesch 1976.

¹⁵ Gudea 2007, 233.

¹⁶ Bindea 2008, 151–152.

¹⁷ Bindea 2008, 163.

¹⁸ Udrescu, Bejenaru, Hrișcu 1999, 79.

¹⁹ Udrescu, Bejenaru, Hrișcu 1999, 97.

²⁰ Udrescu, Bejenaru, Hrișcu 1999, 86.

²¹ Bindea 1999, 100.

Covasna²². Furthermore, there were pigs with the mandible affected by periodontitis on all three sites. Such afflictions, but also other types of pathologies have been mostly stressed on a series of Bronze Age sites²³.

The archaeozoological analysis of the bone lot from Jigodin, thus quantitatively unsatisfying, has suggested several characteristics of food economy and has revealed similarities with contemporary populations from the vicinity.

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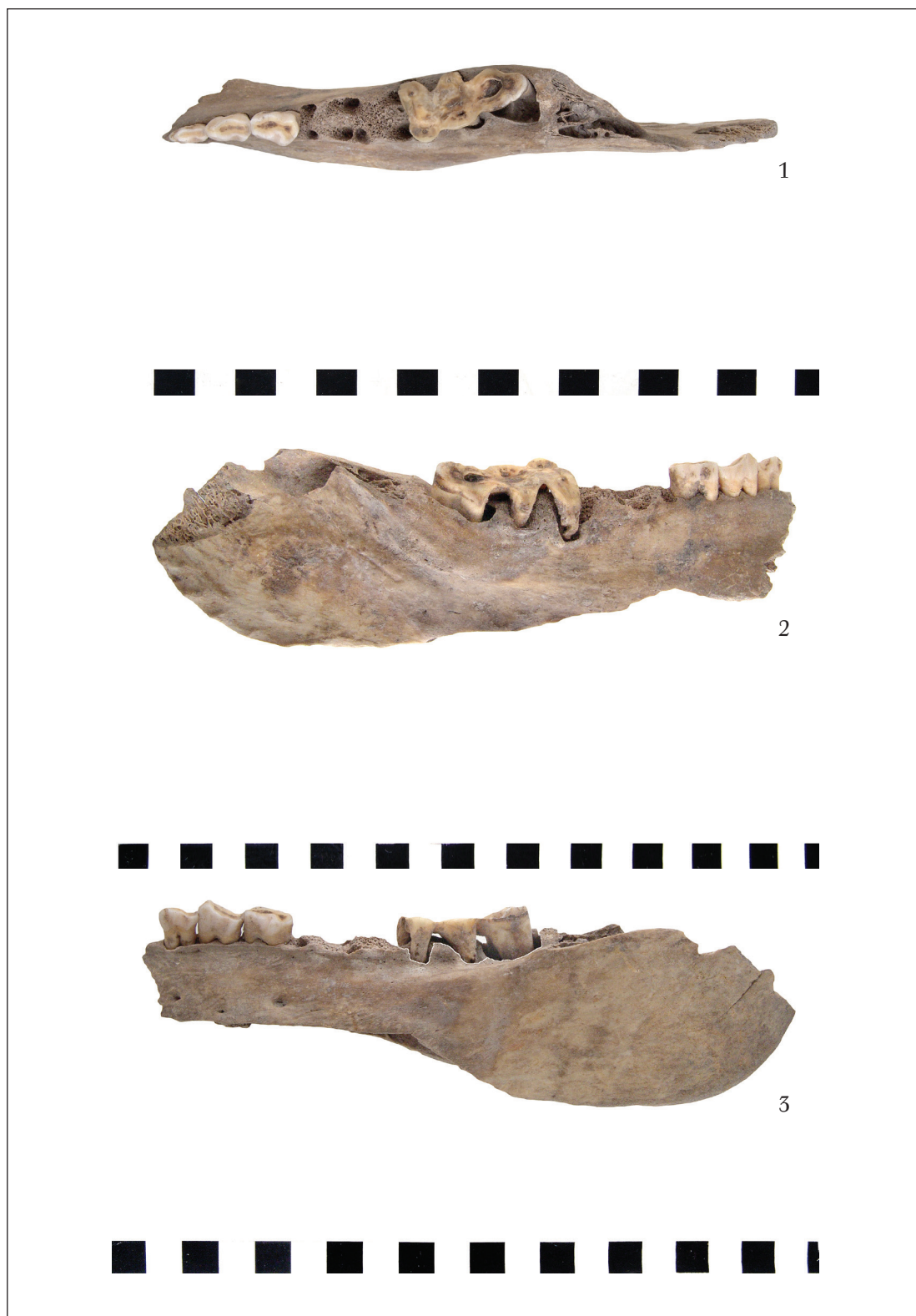
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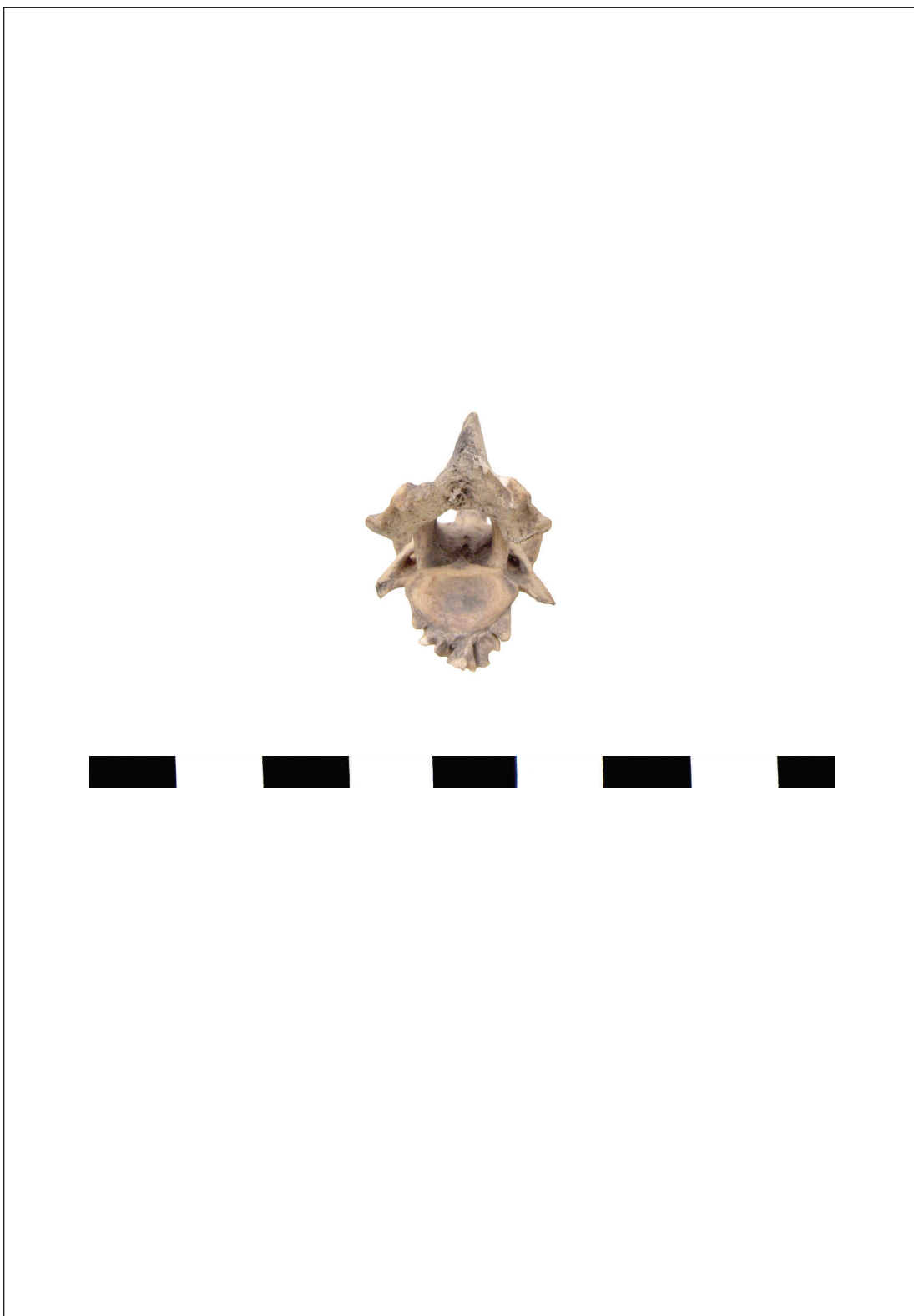
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²² Bindea 2005, 176.

²³ Haimovici, Hrisanidi 1969, 216-223.



Pl. I. *Sus scrofa domestica*, mandible with periodontitis.
1. Dorsal view. 2. Lingual view. 3. Lateral view.



Pl. II. *Canis familiaris* (dog), axis with osteophytes (caudal view).

	<i>Bos taurus</i>			<i>Sus scrofa domestica</i>						<i>Ovis aries / Capra hircus</i>		<i>Equus caballus</i>	<i>Canis familiaris</i>	<i>Cervus elaphus</i>
Bd	60*						36.4	36.3	37.1		28.7°	30.1°		
BT				28.1*			27.8	31.2	29.2		27.3°	28°		
APDd							36	40.1	36.7		23.9°	25.5°		
Radius														
Bp	83.8	78*		26								32.3°		56.5
BFp	75.4											30.7°		53.6
APDp	42.3			18.7										32.7
Bd											28.8*			
APDd											20.3*			
Cubitus														
BPC	43.4	48		19.8	19.5	31.2	17.9*	16.2						
DPA				33.8	32.4	36.3					26.6°			
LO				52							43.5°			
SDO				24.4							23.8°			
Metacarpus														
GL	188.4									112.3°	133.2°			
Bp	53.3	49.3	47.2	51						20.1°	23°	22.2°		
APDp	34.5	31.3	28.6	32						14.9°	16.9°	15.4°		
SD	28.8									12.5°	13.5°	12.3°		
APDdf	21.8									9°	9.9°	8.9°		
Bd	54.5									23.3°				
APDd	28.4									14°	16.2°			
Index 1 (Bp × 100 / GL)	28.29									17.9°	17.3°			
Index 2 (SD × 100 / GL)	15.28									11.1°	10.1°			

	<i>Bos taurus</i>		<i>Sus scrofa domestica</i>							<i>Ovis aries / Capra hircus</i>			<i>Equus caballus</i>	<i>Canis familiaris</i>	<i>Cervus elaphus</i>
		53													
GLm															
DI	32.5														
Dm		29.4													
Metatarsus															
Bp		37.3													
APDp		38.1													
APDd	25.1														
Metatarsus III															
Bp							15.5								
SD							13.1								
Metapodiu															
Bd													51		
APDd													38.6		
Phalanx I															
GL	54.4														
Bp	22.9												57		
BFp													47.8		
Dp													41.2		
SD	19.8														
Bd	22.6														
Phalanx III															
MBS	18.1														
LF	27.3														
BF	19														
Atlas															
H							45							27.3	

	<i>Bos taurus</i>		<i>Sus scrofa domestica</i>					<i>Ovis aries</i> / <i>Capra hircus</i>		<i>Equus caballus</i>	<i>Canis familiaris</i>	<i>Cervus elaphus</i>
BFcr			52.1								38.2	
BFcd											30.5*	
GB											30*	
Axis												
H											41.5*	
B dens	35.4											
LCDe											47.6	
BFcr											27.9	
BFcd											18	
SBV											19.4	

* - approximate metric values

o - *Ovis aries*

c - *Capra hircus*

p - mandible with periodontitis

APDd - Antero-posterior diameter of the distal end; APDdf - Antero-posterior diameter of the diaphysis; APDp - Antero-posterior diameter of the proximal end; Bd - Breadth of the distal end; B dens - Breadth of the dens; BF - Breadth of the Facies articularis; BFcd - Breadth of the Facies articularis caudalis; BFcr - Breadth of the Facies articularis cranialis; BFd - Breadth of the dens; BFp - Breadth of the Facies articularis distalis; BFp - Breadth of the Facies articularis proximalis; BG - Breadth of the glenoid cavity; Bp - Breadth of the proximal end; BPC - Breadth across the coronoid process; BT - Breadth of the Trochlea; DC - Depth of the Caput femoris; D1 - Depth of the lateral half; Dm - Depth of the medial half; Dp - Depth of the proximal end, DPA - Depth across the Processus anconeus; GB - Greatest breadth; GL - Greatest length; GLl - Greatest length of the lateral half; GLm - Greatest length of the medial half; H - Height; Hm P_2 - Height of mandible in front of P_2 ; Hm M_1 - Height of mandible in front of M_1 ; L C alv. - Length of the canine alveolus; LCDe - Length in the region of the corpus including the dens; L dp²-dp⁴ - Length of the upper deciduous premolar row; L dp₂-dp₄ - Length of the lower deciduous premolar row; L dp₄ - Length of the lower deciduous 4th premolar; L P_1 - M_3 / L P_2 - M_3 - Length of the lower cheektooth row; L P_2 - P_4 - Length of the upper premolar row; L P_1 - P_4 / L P_2 - P_4 - Length of the lower premolar row; L M^1 - M^3 - Length of the upper molar row; L M_1 - M_3 - Length of the lower molar row; L M^3 - Length of the upper 3rd molar; L M_3 - Length of the lower 3rd molar; LA - Length of the acetabulum; LF - Length of the Facies articularis; LO - Length of the olecranon; LS - Length of the symphysis; MBS - Middle breadth of the sole; SBV - Smallest breadth of the vertebra; SD - Smallest breadth; SDO - Smallest depth of the olecranon; SLC - Smallest length of the Collum scapulae.