

THE ARCHAEOZOOLOGICAL RESEARCH OF THE COȚOFENI SETTLEMENT AT CHEILE TURULUI (CLUJ COUNTY)

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Abstract: The faunal material discovered in the Coțofeni settlement at Cheile Turului is the result of the archaeological campaign of 2011. The lot sums up 177 bone remains that belong in 82% to mammals, the rest corresponding to invertebrates, the majority being gastropod shells. The domestic/wild mammals ratio is 95.08/4.92% according to the number of remains (noted NR) and 68.75/31.25% according to the minimum number of individuals (noted NMI). Among the domestic mammals we identified the species important from the dietary point of view: domestic cattle, sheep and goat, pig but also dog fragments. The list of wild mammals comprises the Roe deer, aurochs, wild boar, hare and a rodent. In the Coțofeni settlement at Cheile Turului predominant are the ovicaprines. Pig ranks second. Cattle, although coming third in what frequency is concerned, due to the large size rank first from the diet point of view. The game, especially of large size (aurochs, wild boar), identified in the settlement was also important for supplementing food necessities.

Keywords: archaeozoology; fauna; bones; Cheile Turului; Coțofeni culture.

Rezumat: Materialul faunistic descoperit în așezarea Coțofeni de la Cheile Turului provine din campania de săpături arheologice desfășurată în anul 2011. Lotul însumează 177 de resturi osoase ce aparțin în proporție de 82% mamiferelor, restul corespunde nevertebratelor, majoritatea fiind cochilii de gasteropode. Raportul mamifere domestice/sălbatică este 95.08/4.92% după numărul de resturi (notat NR) și 68.75/31.25% după numărul minim de indivizi (notat NMI). În cadrul mamiferelor domestice au fost identificate speciile importante din punct de vedere alimentar: bovinele domestice, ovicaprinele și suinele, alături de fragmente de câine. Lista mamiferelor sălbatică cuprinde căpriorul, bourul, mistrețul, iepurele și un rozător. În așezarea Coțofeni de la Cheile Turului predominante sunt ovicaprinele. Suinele ocupă locul secund. Bovinele, deși se plasează pe poziția a treia ca frecvență, din punct de vedere al ponderii în alimentație ocupă primul loc, datorită taliei mari. În suplimentarea necesarului de hrană aveau importanță și speciile vânată, mai ales cele cu talie mare (bourul, mistrețul) identificate în așezare.

Cuvinte cheie: arheozoologie; faună; oase; Cheile Turului; cultura Coțofeni.

The faunal material discovered in the Coțofeni settlement at Cheile Turului is the result of the archaeological campaign of 2011¹. The lot sums up 177 bone remains (Tab. 1; Fig. 1) belonging in 82% to the mammals, the rest corresponding to the invertebrates, the majority being gastropod shells (4 complete, 27 fragments). A single remain belongs to the lamellibranchiate. The faunal sample, with appearance of

¹ We hereby thank the team of archaeologists who performed the excavation – Mihai Rotea, Andrei Gonciar, Tiberiu Tecar – for the material assigned to us and the archaeological information provided.

domestic refuse, is in poor conservation state, being strongly fragmented. The appearance of domestic refuse (resulted following consumption) is given, on one hand, by the way the bones were broken (fragmentation), and on the other, by the cutting prints (defleshing) visible on some of the remains.

Species	NR	%	NMI	%
<i>Bos taurus</i>	21	17.21	2	12.5
<i>Ovis aries</i> / <i>Capra hircus</i>	56	45.9	5	31.25
<i>Sus scrofa domesticus</i>	32	26.22	3	18.75
<i>Canis familiaris</i>	7	5.73	1	6.25
Domestic mammal remains	116	95.08	11	68.75
<i>Capreolus capreolus</i>	2	16.39	1	6.25
<i>Bos primigenius</i>	1	0.81	1	6.25
<i>Sus scrofa ferus</i>	1	0.81	1	6.25
<i>Lepus europaeus</i>	1	0.81	1	6.25
<i>Rodentia</i>	1	0.81	1	6.25
Wild mammal remains	6	4.92	5	31.25
Determined mammal remains	122	100	16	100
<i>Ovis/Capra/Capreolus</i>	1			
Large size ribs	3			
Small-average ribs	19			
Total mammal remains	145			
Gastropods	31			
Lamellibranchiate	1			
Total	177			

Table 1. Material frequency per species.

1. Description of the faunal material

The domestic/wild mammals ratio is 95.08/4.92% according to the number of remains (noted NR) and 68.75/31.25% according to the minimum number of individuals (noted NMI). Among the domestic mammals we identified the dietary important species: domestic cattle, sheep-goat and pig, beside dog fragments. The list of wild mammals comprises the Roe deer, the aurochs, the wild boar, hare and a rodent.

Ovis aries / *Capra hircus* (ovicaprines)

The ovicaprines group represents the majority in the settlement at Cheile Turului by a 45.90% percentage according to the NR and 31.25% according to the NMI. The age group distribution for the 5 estimated individuals is as follows: under 1 year; between 2–2½ years; 2½–3 years; ca. 5 years and past 5 years.

The distribution per anatomical parts (Tab. 2) reveals the predominance of the non-edible parts (82%). The advanced fragmentary state is also seen in teeth, the number of fragments corresponding to isolated teeth being very high. The differential sheep – goat diagnosis was very difficult still because the poor preservation state of the material. Therefore, the difference was possible for only 6 fragments, which were assigned to species *Ovis aries* (lacteal premolar, two astragals and one calcaneus) and

Capra hircus (metacarpal and astragal). Given the deciduous premolar (dp_4)², we appreciate that the individual under 1 year is sheep.

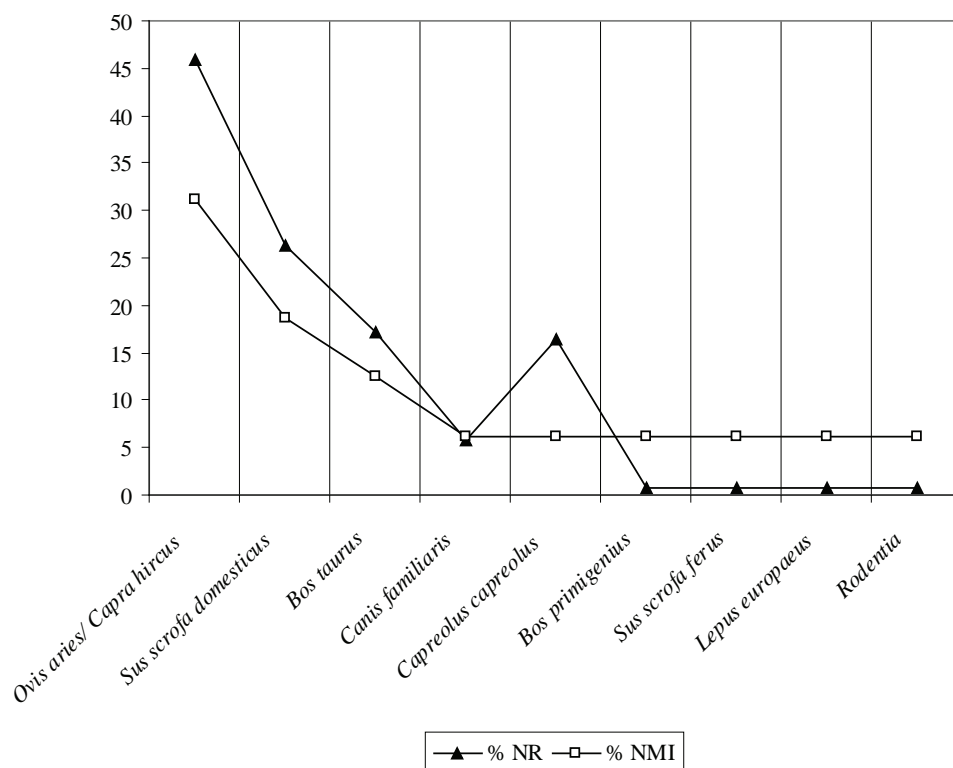


Fig. 1. Mammal ratio within the settlement.

Complete astragals, two of *Ovis* and one of *Capra*, provided the possibility to compute the withers height, using the Teichert coefficients³. The obtained values are of 65.31 cm and 66.22 cm for *Ovis aries* (likely this is the same individual from which we recovered the two complete astragals: left and right) and of 59.64 cm for *Capra hircus*.

The predominance of the small ruminants is visible also when we refer to the number of ribs included in the “small-average size” category, accounting 19 fragments, compared to those of “large size”, which are only three.

	<i>Bos taurus</i>	<i>Ovis / Capra</i>	<i>Sus domesticus</i>
Horns			
Skull			1
Maxillary			

² Hillson 1984, 101.

³ Driesch, Boesneck 1974, 339.

Mandible	2	8	4
Isolated teeth	8	27	19
Atlas	1		
Axis			
Scapula	1		
Humerus		2	
Radius	1		
Cubitus			1
Carpal	1		
Metacarpal	1	1	
Coxal	2		
Femur		1	1
Patella			
Tibia		2	1
Calcaneus	1	1	1
Astragal		3	1
Centrotarsal		1	
Metatarsal			1
Metapodial		1	
Phalanx I		3	
Phalanx II	2		
Phalanx III		1	
Vertebrae		5	1
Ribs	1		1
Total	21	56	32

Table 2. Distribution of domestic species skeletal remains by anatomical parts.

***Sus scrofa domesticus* (domestic pig)**

To the domestic pig belong 32 fragments, which represent a percentage of 26.22% (according to the NR) and 18.75% (according to the NMI). According to such frequency, the pig ranks second among the species exploited at Cheile Turului. The criterion used to estimate the minimum number of individuals is teeth eruption and wear. We appreciate that a minimum of 3 individuals between 1-1½ years (16-17 months), 1½-2 years and 2-2½ years were butchered. A dog fragment records the existence of a male individual.

The fragmentary nature of the material suggests the predominance of the isolated teeth, representing more than half of the remains of this species (of the 32 fragments only 4 come from the edible parts of the skeleton).

An astragal with the side length of 42.6 mm allowed the estimation of a 78.55 cm size.

***Bos taurus* (domestic bovids)**

Species important from a dietary point of view, *Bos taurus* ranks only third among the Cheile Turului analysed lot. The frequency is of 17.21% (NR) and 12.5% (NMI). The absence of the maxillary remains, elements based on which age estimation

is more relevant, made more difficult the calculation of NMI. We appreciate that the determined remains come from a minimum 2 individuals, a juvenile under 3 years (an unossified calcaneus) and one adult, likely senile (advanced teeth wear).

Compared to the other important dietary groups (sheep/goat and pig), in which the ratio of the edible parts was more reduced, in the bovids case, the frequency of the skeletal elements coming from edible parts is the highest, of 23.8%.

Canis familiaris (the dog)

The dog is present in the site at Cheile Turului by seven remains coming very likely, from a single individual. We estimate an age of ca. 1–1½ years (epiphyseal radius, unossified lumbar vertebra). With a percentage of 5.73% (according to the NR) and 6.25 % (according to the NMI), this species is well represented in the settlement.

Wild species

Within the analysed sample, the wild species are represented on one hand by wild mammals (6 fragments), and on the other by invertebrates (32 fragments). By cumulating these two groups and comparison with the total number of the determined remains, we have obtained a 27.5% frequency for the wild species, a relatively high ratio for an archaeozoological sample.

The identified wild mammals – *Capreolus capreolus* (roe deer), *Bos primigenius* (aurochs), *Sus scrofa ferus* (wild boar), *Lepus europaeus* (hare) and a species of *Rodentia* order (a rodent) – are represented, each (except the roe deer), by a single bone fragment. The roe deer is represented by a molar and a proximal phalanx (adult individual), the aurochs and wild boar by a scapular fragment each, the hare by an atlas and the rodent by a long bone.

A scapula fragment was included in the category *Ovis / Capra / Capreolus* (the specific assignment being rather difficult). The metric data of the skeletal remains are shown in the appendix.

Certain unidentified bone fragments exhibit butchery prints or human intervention prints (including defleshing). A fragment sharpened by polishing has the appearance of an arrowhead. Other two remains displayed polishing traces. A diaphyseal fragment of a large size animal has the walls purposefully sectioned. Moreover, on other two diaphyseal remains, belonging to small-average size animals, were noted four cuts on one of them, and on the other, two parallel longitudinal ca. 8–9 mm lines (cuts).

A relatively high number of remains (39) exhibit fire contact traces, some being burnt, other showing black burning stains.

2. Characteristics of the animal economy

In the Coțofeni settlement at Cheile Turului the small horned animals are predominant. The fact they were sacrificed, both in the juvenile or sub-adult stage as well as during adulthood records they were bred for meat and by-products, without neglecting the maintenance of a reproductive stock. The meat quantity supplied by sheep-goat – 11.96% is significantly lower compared to that provided by cattle – 32.71 % (Fig. 2).

The large horned animals, although rank third from the point of view of the number of both remains and individuals, they come first in diet, due to the large size. Moreover, these animals supplied a significant quantity of by-products – milk, skins, raw material for bone processing and the possibility to use them for hauling purposes. When mature, the individuals also ensured the species reproduction.

Pigs were bred exclusively for meat and fat, therefore, the majority were sacrificed (except, those bred for reproduction) until 2–2½ years, when the animal reached optimal weight. At Cheile Turului, the ratio of the hunted species for food seems to have been significant, comprising large size species (the aurochs, wild boar) identified in the settlement.

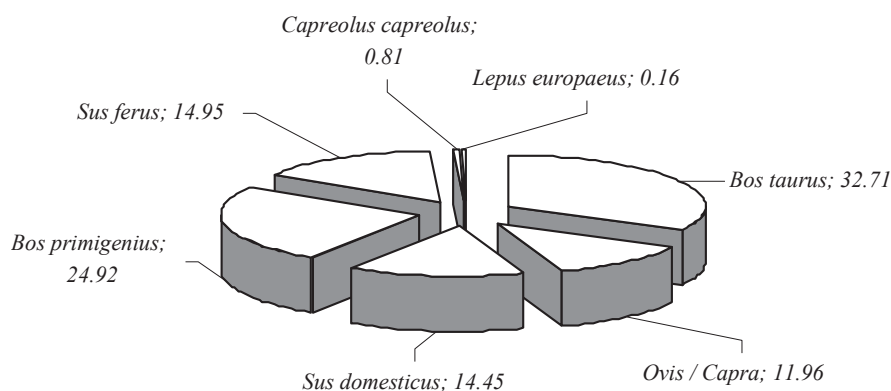


Fig. 2. Meat quantity supplied by the identified species.

When attempting to establish certain specificities of the food economy at Cheile Turului, we noted, firstly, the importance of the animal husbandry, hunting being a secondary occupation. It seems that ovicaprids and domestic pig were more important during the early periods – Coțofeni culture, situation noticed also if we consider a more extended area – Transylvania.

3. Analogies of the studied settlement with contemporary sites

Within the sites pertaining to the Coțofeni culture, the archaeozoological research records significant differences in both domestic/wild species ratio as well as the means of exploiting various mammals. At present, there are a few analysed faunal lots. For instance, in Transylvania, samples investigated archaeozoologically are found at Ghida⁴, Poiana Ampoiului⁵, Livezile⁶, Peștera Cauce⁷, Șincai⁸, Tărtăria⁹, Florești¹⁰, Cicău¹¹, Tebea, Boiu¹².

⁴ Haimovici 1994, 401–404.

⁵ Becker 2000, 69–74.

⁶ Becker 2000, 74–77.

⁷ El Susi 2005, 114–118.

⁸ Bindea 2005, 57–58; Bindea 2008, 78–80.

⁹ Bindea 2005, 58–59; Bindea 2008, 80–82.

¹⁰ Kelemen 2009, 489–520.

¹¹ Georocanu, Lisovschi-Chelășanu, Georocanu 1978, 273–274.

¹² Andrițoiu 1992, 132.

Cheile Turului is one of the settlements with the highest frequency of domestic mammals, 95.08% (Fig. 3), preceded only by the sites where wild species are missing: Florești, Tebea, Boiu.

Domestic/wild mammal ratios close to that computed for Cheile Turului are found at Poiana Ampoiului, Livezile, Șincai. If we take into account the presence of the invertebrates in a significant ratio at Cheile Turului, 18% of the total determined material, wild species increase their importance, gathering molluscs being, likely, an occupation possibly more important than hunting wild mammals. The molluscs' presence was recorded in many Coțofeni settlements, for instance, in Transylvania, at Poiana Ampoiului, Tărtăria, Livezile, Boiu. The relatively intense exploitation of the molluscs seems to have been a characteristic of the settlements dating to the transition period to the Bronze period¹³.

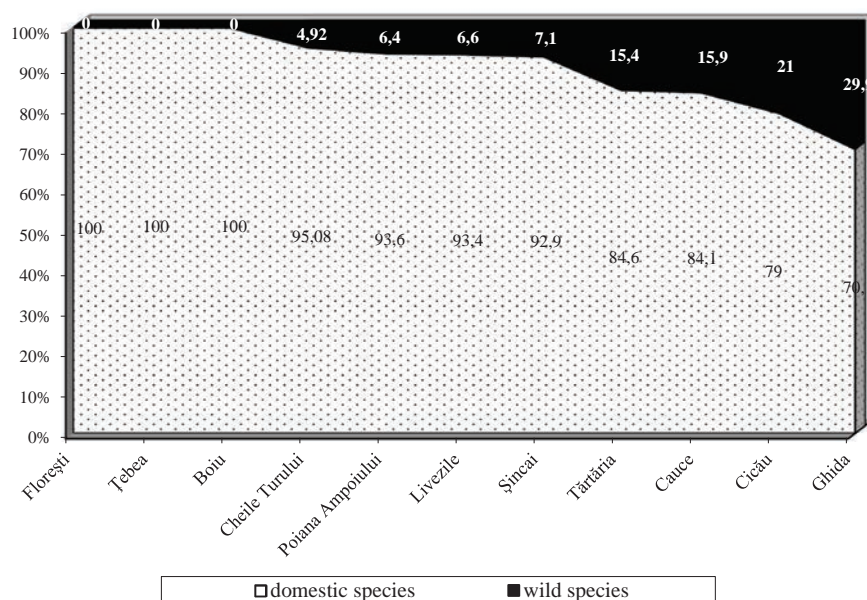


Fig. 3. Domestic/wild mammals ratio in Coțofeni sites of Transylvania.

Animal husbandry, important occupation in the Coțofeni settlements analysed archaeozoologically, was mainly focused on breeding large and small horned animals. The Coțofeni sites may be divided into two categories (Fig. 4), as mentioned elsewhere as well¹⁴: on one side, settlements where exploitation is directed firstly on breeding cattle, like at Florești, Tărtăria, Șincai, Ghida, Cicău, and on the other, sites where animal husbandry was oriented towards sheep/goat, category which includes the settlements at Cheile Turului, Peștera Cauce, Tebea, Boiu, Poiana Ampoiului and Livezile.

In what the exploitation of pig for food purposes, Cheile Turului is one of the Coțofeni settlements with a rather high pig percentage. In Transylvania, only at Florești pig is highly frequent, succeeding cattle as significant provider of animal proteins.

¹³ El Susi 1996, 156.

¹⁴ Bindea 2005, 62.

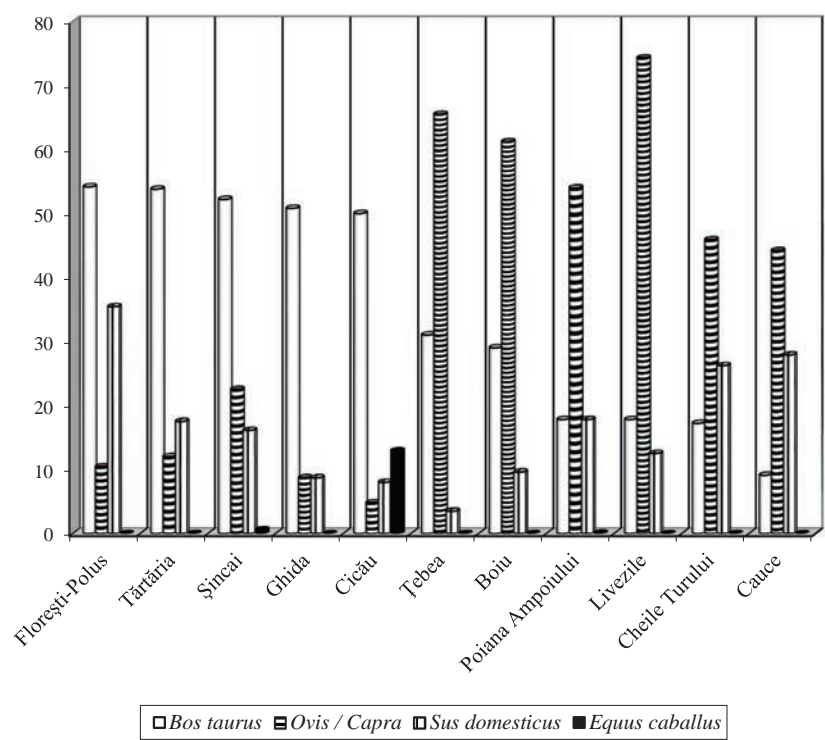


Fig. 4. Frequency of domestic mammals in Coțofeni sites of Transylvania.

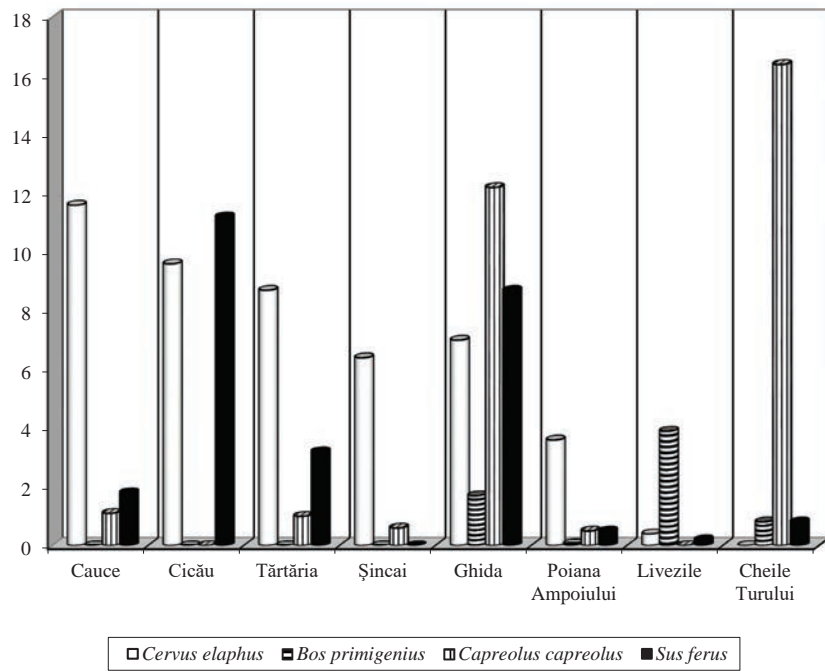


Fig. 5. Frequency of wild mammals in Coțofeni sites from Transylvania.

Hunting had no well defined role in some of the Coțofeni settlements (Fig. 5). This category may include, beside Florești, Țebea and Boiu, where wild mammals are

absent, sites with low frequency of these mammals, like for instance Cheile Turului, Poiana Ampoiului, Livezile and Șincai. If in some of the sites, the hunting species of choice was the red deer (Tărtăria, Șincai, Poiana Ampoiului), in others it was the wild boar (Cicău), the aurochs (Livezile) or, possibly, the roe deer (Cheile Turului).

4. Final considerations

Although the faunal sample at Cheile Turului is small, the archaeozoological analysis outlines a few characteristics of the animal economy. Thus, the studied site may be framed in the category of those focused on exploiting sheep/goat. The role of the domestic bovids and pig is significant and that of the wild species is, apparently, less important.

Ecologically, the identified species belong to woodlands – the wild boar, wood-sides, open woods – the roe deer and aurochs or open spaces – the hare.

The Coțofeni culture was relatively well studied from an archaeozoologic point of view on the territory of Romania. Still, the Transylvanian space is much poorer in faunal data, reason for which additional osteological analyses would be required for this area. In the context of a larger period of time, which would include the end of the Eneolithic and the start of the Bronze age and of a more extended geographical area, one may distinguish certain specificities of the food economy based on either animal exploitation or hunting.

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Appendix. Metric data retrieved from the faunal material at Cheile Turului

Species Measurements	Values (mm)						
	<i>Bos taurus</i>	<i>Ovis aries / Capra hircus</i>	<i>Sus domesticus</i>	<i>Canis familiaris</i>	<i>Bos primigenius</i>	<i>Sus ferus</i>	<i>Capreolus capreolus</i> <i>Lepus europaeus</i>
Atlas							15
GL							34,5
GB							15
BFcr							19,3
BFcd							
Axis							
BFcr				31			
LAPa				47*			
Isolated dentition							
L dp2-dp4		35,5					
L dp4		18,5					
B dp4		7,2					
L M ₁ -M ₃			70*				
L M ₃		23,2	35*				
B M ₃		8,8					
Scapula							
GLP	68,4			20,5	93,6	44,8	
LG	59			18,2	80,8	38	
BG	49,5			13	72,5	33,3	
SLC	53			15,8		30	
Radius							
APD p	47,4			17,5			
Bd				13,6			
BFd				10			
APD d							

Species		Values (mm)						
Measurements	<i>Bos taurus</i>	<i>Ovis aries / Capra hircus</i>	<i>Sus domesticus</i>	<i>Canis familiaris</i>	<i>Bos primigenius</i>	<i>Sus ferus</i>	<i>Capreolus capreolus</i>	<i>Lepus europaeus</i>
Cubitus								
BPC			15,8	12,4				
LO				20				
SDO				15,7				
DPA				18,5				
Metacarpus								
Bp	51,2*							
Pelvis								
LA	77							
BA	64,8							
SB				11				
SH				21,2				
Tibia								
SD		12,3						
APD df		10,2						
Bd			27					
BFd			22					
APD d			24,3					
Astragalus								
GLl		28,8 <i>Ovis</i>	29,2 <i>Ovis</i>					
GLm		28	27,7	26,3 <i>Capra</i>				
DI		16,3	16	25,5				
Dm		14	14,8	15,4				
Bd		19,6	17,6	15,7				
Talia (Teichert)		653,31	662,25	25,2				
Calcaneus			28,3	785,54				
GB	47,3	16	23					

Species Measurements		Values (mm)							
		<i>Bos taurus</i>	<i>Ovis aries / Capra hircus</i>	<i>Sus domesticus</i>	<i>Canis familiaris</i>	<i>Bos primigenius</i>	<i>Sus ferus</i>	<i>Capreolus capreolus</i>	<i>Lepus europaeus</i>
Centrotarsus									
GB		22,6							
Phalanx I									
Bp									
SD		9	6,3					12,8	

APD d - Antero-posterior diameter of the distal end; APD df - Antero-posterior diameter of the diaphysis; APD p - Antero-posterior diameter of the proximal end; BA - Breadth of the acetabulum; Bd - Breadth of the distal end; BFcr - Breadth of the Facies articularis cranialis; BFcd - Breadth of the Facies articularis caudalis; BFd - Breadth of the Facies articularis distalis; B M₃ - Breadth of the lower 3rd molar; Bp - Breadth of the proximal end; BPC - Breadth across the coronoid process; Dl - Depth of the lateral half; Dm - Depth of the medial half; DPA - Depth across the Processus anconaeus; GB - Greatest breadth; GL - Greatest length; GLl - Greatest length of the lateral half; GLm - Greatest length of the medial half; GLP - Greatest length of the Processus articularis (glenoid process); L dp₄ - Length of the deciduous 4th lower premolar; L dp₂ - Length of the deciduous (2nd-4th) premolar row; L M₁-M₃ - Length of the lower molar row; L M₃ - Length of the lower 3rd molar; LA - Length of the acetabulum; LAPa - Length of the arch including the Processus articularis caudalis; LG - Length of the glenoid cavity; LO - Length of the olecranon; SD - Smallest breadth; SB - Smallest breadth of the shaft of ilium; SDO - smallest depth of the olecranon; SH - smallest height of the shaft of ilium; SLC - Smallest length of the Collum scapulae.