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THE ARCHAEOZOOLOGICAL MATERIAL IN THE NOUA SETTLEMENT AT BOLDUȚ (CLUJ COUNTY)

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Abstract: The analysed archaeozoological sample comes from the archaeological excavation performed in 2006 and gathers 109 determined bone remains, dated to the Bronze Age, Noua culture. The lot, numerically small, has the appearance of domestic waste and belongs entirely to mammals. The majority are domestic, in 94.85% (according to NR) and 76.92% (according to NMI). In Bolduț, bovines were the key to the economy. They were firstly bred for meat, most being slaughtered before adulthood, and secondarily, for other by-products and utility purposes. Beside bovines, other species, like ovicaprines, swine and horse were also important sources. In small quantities emerge dog, red deer, roe deer and a rodent.

Keywords: archaeozoology; bones; Bronze Age; Noua culture; Bolduț.

Rezumat: Eşantionul arheozoologic analizat provine din săpătura arheologică efectuată în anul 2006 şi cumulează 109 resturi osteologice determinate, datate în epoca bronzului, cultura Noua. Lotul, redus numeric, are aspect de resturi menajere şi provine în totalitate de la mamifere. Ponderea o deţin cele domestice, cu un procentaj de 94.85% (după NR) şi de 76.92% (după NMI). La Bolduț bovinele deţin rolul primordial în economie. Acestea erau crescute în primul rând pentru carne, fiind sacrificate în mare parte înainte de-a atinge vârsta maturităţii, iar în mod secundar pentru alte produse şi în scop utilitar. Bovinele sunt urmate de alte specii cu importanţă alimentară: ovicaprine, suine şi cal. În cantităţi mici, apar câinele, cerbul, căprioru şi un rozător.

Cuvinte cheie: arheozoologie; oase; epoca bronzului; cultura Noua; Bolduț.

The analysed archaezoological sample comes from the archaeological excavation carried out in 2006[1] and gathers 109 determined osteological remains dated to the Bronze Age, Noua culture. The lot, numerically small, has the appearance of domestic waste and belongs entirely to mammals. The majority are domestic (Tab. 1; Fig. 1), in 94.85% (according to NR) and 76.92% (according to NMI)[2].

Species	**NR**	**%**	**NMI**	**%**
Bos taurus	50	51.54	3	23.07
Ovis aries / Capra hircus	17	17.52	2	15.38
Sus scrofa domesticus	12	12.37	2	15.38
Equus caballus	12	12.37	2	15.38
Canis familiaris	1	1.03	1	7.69
Total domestic mammal remains	92	94.85	10	76.92
Cervus elaphus	2	2.06	1	7.69
Capreolus capreolus	1	1.03	1	7.69

[1] The team was conducted by archaeologist Mihai Wittenberger.

[2] NR = number of faunal remains; NMI = minimum number of individuals.

Species	NR	%	NMI	%
Rodentia	2	2.06	1	7.69
Total wild mammal remains	5	5.15	3	23.08
Total mammal remains	97	100	13	100
Large size ribs	10			
Small-average size ribs	2			
Total	**109**			

Table 1. Frequency of the material by species at Bolduț.

Bos taurus (domestic bovines)

Among the domestic mammals, the majority are bovines with a 51.54% frequency after NR and 23.07% after NMI. Fifty fragments, coming from a minimum of 3 individuals, were determined. Indications regarding the slaughtering age[3] are few: an individual was 3-3½ years old, another was immature, while in the case of the third, it is impossible to establish the age of slaughtering. The distribution of the faunal material according to anatomical elements shows that fragments coming from the non-edible regions (skull and limb extremities) of the skeleton predominate.

The absence of horn apophises makes impossible the appreciation of the morphological bovid types bred by the population in Bolduț. Estimations of their size could not be made either due to the absence of complete long bones in the analysed sample. Therefore, information on the massiveness of *Bos taurus* individuals were supplied by measurements performed on bone fragments (Appendix).

Some cattle remains exhibit traces of anthropic intervention. We mention a fragmentary scapula (Pl. I/1), whose lateral edge of the glenoid cavity was jagged on a length of ca. 4 cm. The ten ridges are 2-3 mm deep. Another piece exhibiting processing traces is a body fragment of a cubitus (ca. 1/3 of the body length) cut in the distal part and polished. Multiple cuts, approximately 5 cm long may also be noticed on the sides. The total length of the piece is of 126.7 mm. There was also identified a proximal fragment of a metatarsal with a bone tissue layer removed along the coalescence hollow, in the medial half, on a length of approximately 6.5 cm and width of ca. 1 cm.

Ovis aries / Capra hircus (ovicaprines)

Ovicaprines rank second as importance within the site at Bolduț, being 17.52% frequent after NR and 15.38% after NMI. Minimum two individuals corresponding to the 17 determined bone fragments were identified. One fragment may be assigned to sheep and two fragments to goats, the other being included in the mixed category *Ovis / Capra*.

One of the ovines was slaughtered at ca. 18 months of age, while the other reached adulthood. Based on the two discovered horns (one complete and the other fragmentary) we suppose that the adult individual could have belonged to the caprines. In terms of distribution on skeletal elements, non-edible regions predominate by 70.59%.

[3] Silver 1963, 252-253.

Within the ovicaprine sample were also identified bone remains with traces of human intervention. Thus, a diaphysis fragment (wall) of a humerus has one of the edges slightly ridged, while four fine cuts are noticeable on the exterior side. The ends of a diaphysis fragment, likely coming from a tibia, exhibit polishing and cutting processing traces. The piece is 43.2 mm long and 13.6 mm wide. The surface of a calcaneus evidences four cuts, two smaller, superficial and two deeper (calcaneus maximum width = 18 mm). Another piece which also exhibits processing traces is a metatarsal split transversally, with more than half diaphysis polished, namely in its lower part. The piece is 112.3 mm long (metacarpal metric data: proximal epiphysis width = 19 mm; proximal anteroposterior diameter = 20.2 mm; diaphysis minimum width = 10 mm; anteroposterior diaphysis diameter = 9.5 mm).

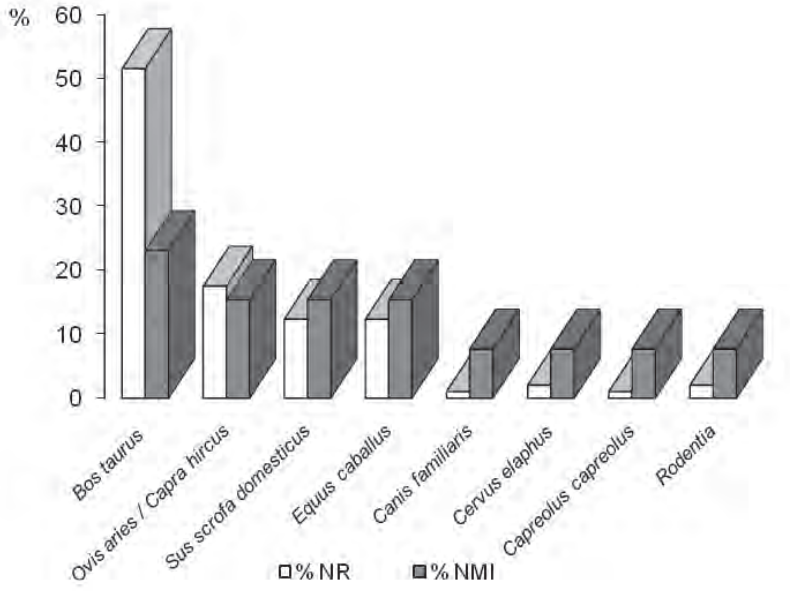

Fig. 1. Mammal ratio within the site at Bolduț.

Sus scrofa domesticus (domestic swine)

The domestic swine gathers 12 fragments, its frequency being of 12.37% (after NR) and 15.38% (after NMI). Minimum two individuals were estimated, one under 2 years of age (un-epiphysed metacarpal, tibia, phalanx) and one of ca. 21–23 months. To the latter belongs a mandible fragment with an unworn third cuspid of molar M_3; M_2 was partially lost during the animal's life, the bone tissue being rebuilt at alveoli level. The presence of a male is recorded by the alveoli of a canine in a fragmentary mandible.

A quarter of the swine remains come from the edible regions of the skeleton. The few measurable fragments explain the impossibility of any appreciations regarding the size of the individuals in the swine population.

A secondary phalanx exhibits on the median side traces of human intervention in the form of 6–7 mm long parallel cuts.

Equus cabalus (horse)

The horse ranks, beside swine, third among the domestic mammals, recording the same percentage of 12.37% (after NR) and 15.38% (after NMI). Phalanges and isolated teeth predominate among the fragments.

We computed the gracility index based on a primary phalanx (proximal epiphysis width × 100 / maximum length). The resulted value is of 38.67. A fragment of a scapula body coming likely from a horse exhibits processing traces, with a ca. 10 cm surface polished by the edge.

Canis familiaris (dog)

From an adult dog comes a complete tibia. Based on the maximum length (195.6 mm), by using Koudelka indices (1885), the size was computed as to 571.15 mm[4]. This value frames the individual in the category of over-average size dogs, the limits for this class being of 50–59.9 cm[5]. The gracility index (minimum diaphysis width × 100 / maximum length) is of 6.64. The limits for the category of average robustness are of 6.6–8.5. Therefore, this individual frames by the lower limit of the interval for average robustness, being very close to the group of gracile dogs[6].

Wild species

There were identified three wild mammals represented by a very small number of fragments, to which correspond a single individual each, their frequency, after NMI, being of 7.69%. From an adult red deer (*Cervus elaphus*) come 2 remains (scapula and tibia), roe deer (*Capreolus capreolus*) is represented by a single fragment of a basal rosetted horn. The piece morphology evidence the horn was detached from the skull, being, likely, collected. From a rodent (*Rodentia sp.*) come two remains (a mandible and a long bone), possibly appearing accidentally in the culture layer (intrusive species).

Since, on several rib fragments species identification was impossible, they were included in two categories: large size ribs (*Equus / Bos / Cervus*) and small-average size ribs (*Ovis / Capra / Capreolus / Sus*). We note that in the lot at Bolduț predominate ribs of large animals, they being the majority also as number of fragments identified in the settlement.

Beside the worked bones belonging to the various species presented above, there were also identified pieces with anthropic intervention marks which could not be determined specifically. Noteworthy is a 99.7 mm long piece, which exhibits by the end a cut in shape of a spiral (hence the twisted appearance (of a «drill») of the tip) (Pl. I/2). A fragment coming from a diaphysis wall of a large size animal is polished. The length of this piece was of 117 mm. Still to a large size species belongs a wide bone fragment with a cut edge and polishing marks and an epiphysis (?) remain with slight traces of cuts and polishes.

[4] von der Driesch, Boessneck 1974, 343.
[5] Udrescu, Bejenaru, Hrişcu 1999, 108.
[6] Udrescu, Bejenaru, Hrişcu 1999, 108.

Some bone remains exhibit fire contact traces. We mention two fragments (secondary phalanx, chest vertebra) belonging to domestic bovids and three unidentified remains with dark burning stains.

Final considerations

In Bolduț, bovids were key in the economy. They were mainly bred for meat, the majority being slaughtered before adulthood, and secondarily for other by-products and utility purposes. In Bolduț, over 50% of the total estimated meat quantity corresponds to bovines, secondly to the horse, which in Prehistory was used as food source.

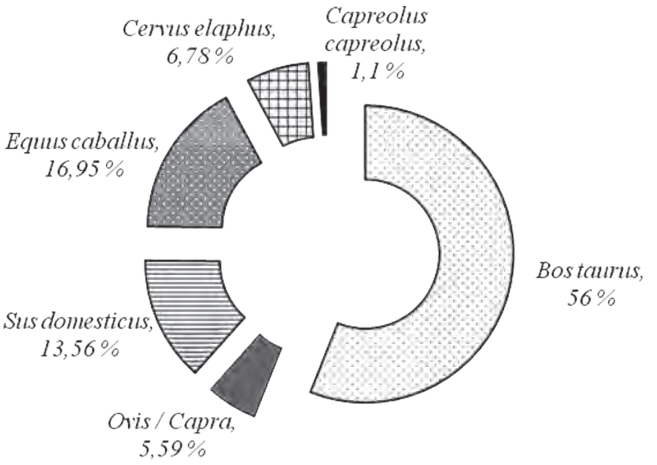

Fig. 2. Meat quantity supplied by the species identified at Bolduț.

The faunal lots within the sites dated to the Bronze Age (Noua culture and not only) discovered in Transylvania are few. This period is better studied outside the Carpathian Arch. Correlations between the faunal data supplied by the sample originating from the settlement at Bolduț and those in the specialty literature, firstly with the sites in Transylvania: Iclod[7], Zoltan[8] and Pălatca[9], but also with other Noua sites on the territory of Moldova, reveal both resemblances and differences between settlements.

The domestic mammal ratio is high in Late Bronze settlements of Transylvania (Fig. 3) and Moldova. Except for the site at Iclod, where the domestic species ratio is almost of 89%, in all the other sites it exceeds 90%. The circumstances are also valid for the Noua settlements in Moldova: Petruşeni[10], Dochia[11], Piatra-Neamț[12], Valea Lupului[13], Bârlad[14], Cavadineşti[15], Gârbovăț[16].

[7] Bindea 2008, 97-98.
[8] El Susi 2002, 153-159.
[9] Bindea, Kelemen 2008-2009, 54-59.
[10] Levitschii, Sava 1993, 130.
[11] Bejenaru, Stupu 2001, 108.
[12] Haimovici 1964, 220.
[13] Haimovici 1963, 172.
[14] Haimovici 1964, 220.
[15] Haimovici 1983, 99.
[16] Haimovici 1991, 163.

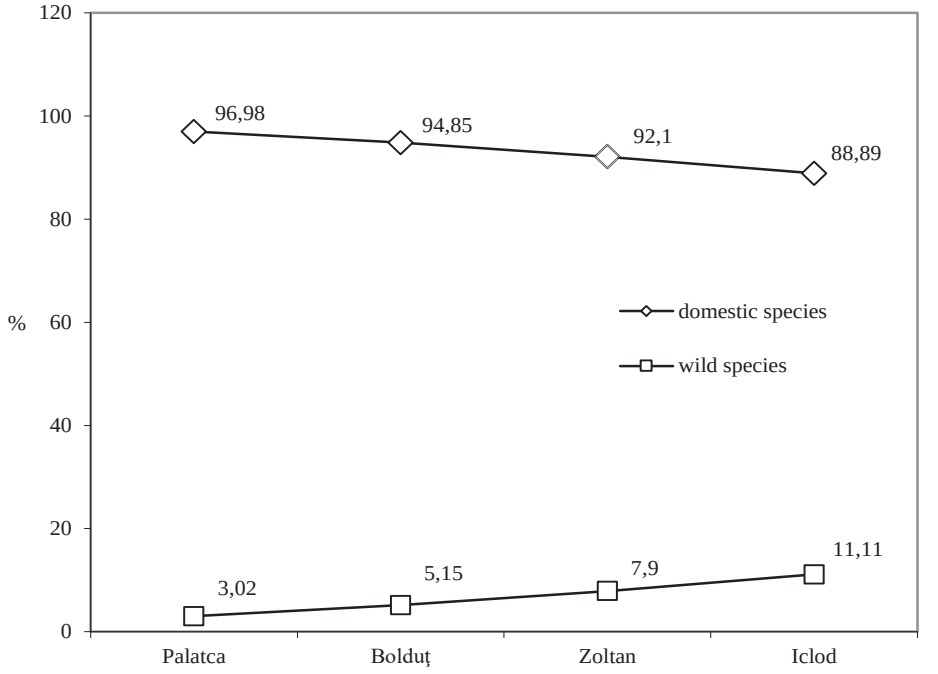

Fig. 3. Domestic/wild mammals ratio in sites belonging to the Late Bronze Age in Transylvania.

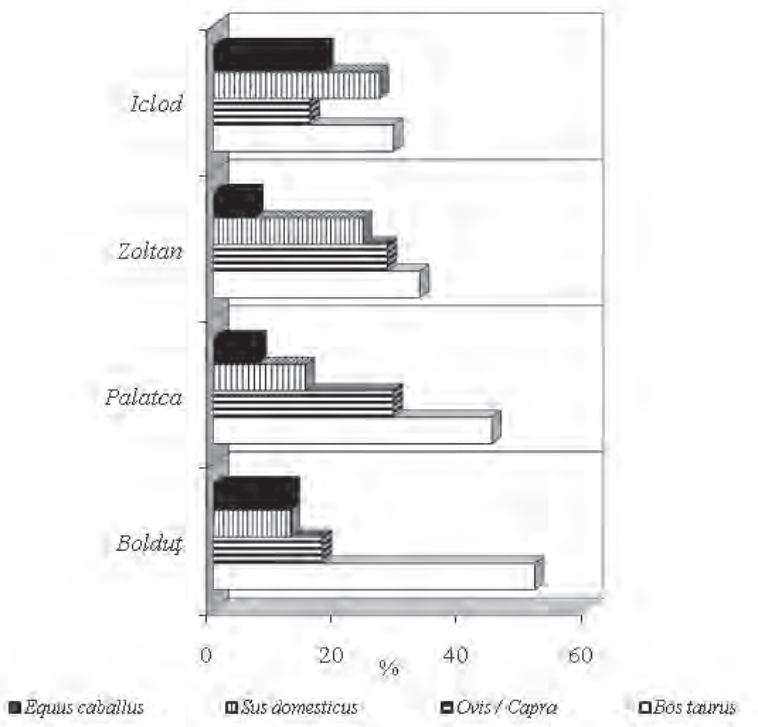

Fig. 4. Frequency of domestic mammals in sites belonging to the Late Bronze Age in Transylvania.

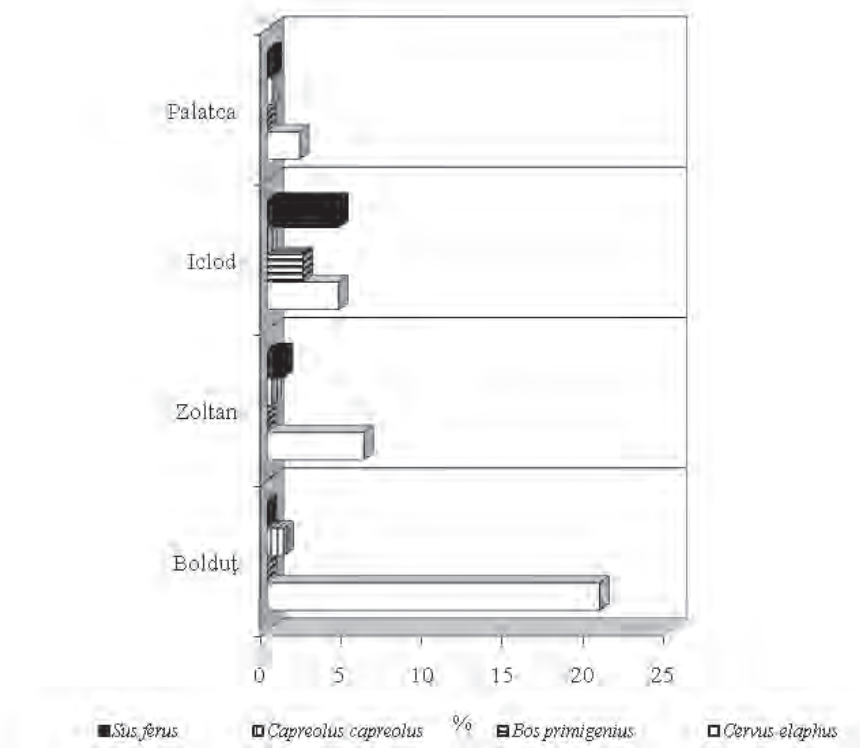

Fig. 5. Frequency of wild mammals in sites belonging to the Late Bronze Age in Transylvania.

The domestic mammals husbandry (Fig. 4) during the Late Bronze Age relied, in all settlements, firstly on bovines, and, secondarily, on ovicaprines, with the exception of the site at Iclod, where domestic swine and caballines preceded ovicaprines. At Bolduț, swine and horses share the third place.

Hunting was focused on large size-species (Fig. 5) - red deer, wild boar, sporadically aurochs –, however roe deer, hare (important as food source) or other species like the bear, wolf, beaver, fox and the badger were also hunted.

Although the Bronze Age communities in Romania were often researched from the archaeozoological point of view as well, we notice that in Transylvania, data referring to various animal husbandries in the Noua culture are very few.

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Appendix. Metric data retrieved from the faunal material at Bolduț

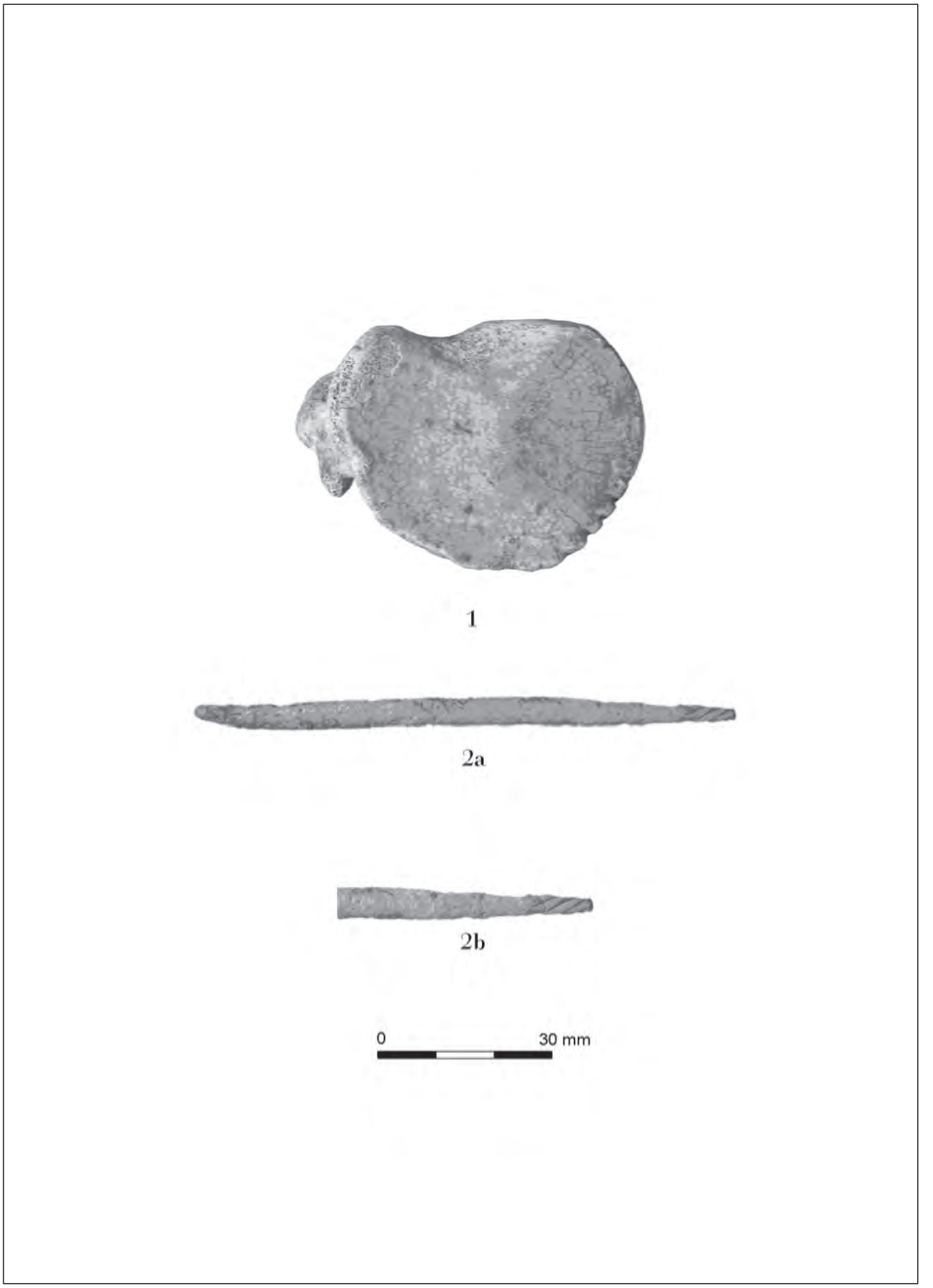
Species / Measurements	*Bos taurus*	*Ovis aries / Capra hircus*	*Sus domesticus*	*Equus caballus*	*Canis familiaris*	*Cervus elaphus*	*Capreolus capreolus*
Horncore							
GL		210[Capra]					
GD base		56.3					
LD base		36.3					
C base		150					46.7*
GD rosette							
Mandible							
L P_2-M_3							
L P_2-P_4	53.2	73*					
Hm P2	32.7 33.7	28*					
Hm M1	41.5						
L M_1-M_3		46.7*					
L M_3		24					
Isolated dentition							
L M_3				29			
Scapula							
GLP	69.2					52*	
LG	58					49	
BG	48 47.3						
SLC	48.7						
Humerus							
SD		14.6	15.3				
Radius							
SD		16.3					
APDdf		8.2					
Cubitus							
BPC	35.7						
Metacarpus							
Bp	59.3						
APDp	36.3						

Species / Measurements	*Bos taurus*	*Ovis aries / Capra hircus*	*Sus domesticus*	*Equus caballus*	*Canis familiaris*	*Cervus elaphus*	*Capreolus capreolus*
Metacarpus III							
Bp			20				
SD			12.4				
Pelvis							
LA	65						
Femur							
DC	43.2						
Tibia							
GL						196.6	
Bp						33.7	
APDp						36.5	
SD						13	
APDdf						12.3	
Bd	57.6 58					22.6	51.8
BFd	39.6 40 40.6*					17.4	40
APDd	43.7 39.5 39.4					16	37.6
Index (SD × 100 / GL)						6.64	
Withers height (Koudelka)						571.15	
Astragalus							
GH				57.5			
GB				58.5			
Bfd				55.6			
LmT				50			
GLl	64.7						
GLm	60.6						
Dl	34.4 32						
Dm	31.6 30.8						
Bd	40.5						
Calcaneus							
GB		18		51.4			

Species / Measurements	*Bos taurus*	*Ovis aries / Capra hircus*	*Sus domesticus*	*Equus caballus*	*Canis familiaris*	*Cervus elaphus*	*Capreolus capreolus*
Metatarsus							
Bp	45.5	19					
APDp	40	20.2					
SD	25.4	10.4					
APDdf	25.5	9.5					
Phalanx I							
GL	58.6 53*	36.4Ovis		84.8			
Bp	31.4	11.8		54 51.2 50 51			
BFp				49 4 7.3 49 47			
Dp				35.7 32.6 31.6 34.2			
SD	24.8	10	17.4	32.8 34 32.6			
Bd	27.5	11	19.3	44.7			
BFd				42.9			
Index (Bp × 100 / GL)				71.05			
Index (SD × 100 / GL)				38.67			
Phalanx II							
GL	36 41.5		27.5	45			
Bp	24.5 34.4		16.5	49.4			
BFp				45.5			
APDp				30.4			
SD	19.3 26.3		12.6	42			
Bd	21.4 28.5		13.8				

* – approximate metric values

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; BFd – 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; C base – Horncore basal circumference; DC – Depth of the Caput femoris; Dl – Depth of the lateral half; Dm – Depth of the medial half; Dp – Depth of the proximal end; GB – Greatest breadth; GD base – Greatest diameter of the horncore base; GD rosette – Greatest diameter of the rosette; GH – Greatest height; 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); Hm P_2 – Height of mandible in front of P_2; Hm M_1 – Height of mandible in front of M_1; L P_2-M_3 – Length of the cheektooth row; L P_2-P_4 – Length of the premolar row; L M_1-M_3 – Length of the lower molar row; L M_3 – Length of the lower 3rd molar; LA – Length of the acetabulum; LD base – Least diameter of the horncore base; LG – Length of the glenoid cavity; LmT – Length of the medial part of the Trochlea tali; SD – Smallest breadth; SLC – Smallest length of the Collum scapulae.



Pl. I. Processed bones discovered at Bolduț. **1.** Worked scapula – ridged – *Bos taurus* (bovine). **2.** Worked bone – "drill shaped" **a.** Full image. **b.** Detail.