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Contents

Animal Bones from the Neolithic (Szakálhát) Levels at Uivar (Timiş County)

Georgeta El Susi

Abstract: In the present study we deal with 3,528 fragments, unearthed from the Szakálhát habitation. Of the 3,528 bones collected from the surfaces S. I-III, circa 1,389 fragments originate in dwelling structures and another 2,139 fragments in the culture layer (no feature). The first part of the article details the faunal samples from the building stages (5, 4a, 3c, 3d) and cultural layer. The metric evaluations and slaughter profiles are presented in the second part of the study. In conclusion, we present the results of the Chi^2 test on the samples from the three phases of neolithic habitation (Szakálhát, Vinča C1, C2), we discuss the percentage changes of taxa and their significance in the husbandry of these phases.

Keywords: Uivar-tell, Szakálhát culture, Vinča C phase, animal husbandry, huntinting.

The fortified settlement of Uivar, point „Gomilă" is located on the lower plain of the Banat, at a height of about 78 metres asl, 35 kilometres southwest of the city of Timişoara. In prehistory, the tell was apparently surrounded on the eastern, northern and west sides by an ancient tributary of the River Bega. In the southern area, a low terrace separated it from another old water course. Until the second half of the 18th century, when the Timiş and Bega rivers were regularized, the area was surrounded by their numerous meanders, which gave rise to ponds and marshes, covering most of the interfluve between the two water courses[1]. The late Neolithic-early Eneolithic tell site at Uivar (County Timiş, Romania) was excavated between 1999–2009 by a joint Romanian-German team, coordinated by Professors Wolfram Schier, from the Free University of Berlin and Florin Draşovean from the Banat Museum, Timişoara. The finds belong for the most part to phase C of the Vinča Culture and somewhat less to the early Eneolithic (Tiszapolgár culture)[2]. About 44,000 mammal remains have been identified and introduced in the database, they come from the neo-eneolithic levels, the Bronze Age, the Iron Age, and the Middle Ages[3]. In the present study, we deal with 3,528 fragments, from the Szakálhat[4] levels. Of the 3,528 bones collected from the surface S. I, circa 1,389 fragments originate in dwelling structures and another 2,139 fragments come from the culture layer (no feature). The assignment of the material to different building stages was done according to the data from the site bibliography[5].

Description of faunal remains from the building stages

Stage 5

From this level, we determined 443 mammalian bones, of which 261 fragments were specifically assigned, according to the data from Table 1. The remainder were collected from pits, foundation ditches, and probably from a structure (suspended floor). Distribution by species shows domesticated mammals prevailed (85.82%), compared to wild species (14.18%). Cattle dominate with 58.24%, followed by ovicaprids (13.79%), pig (12.64%), red deer (8.81%), roe deer (2.68%), dog (1.15%) and hare (0,38%). In the sample of this level, bony elements from all body regions were identified, but the frequency and their representation differs from taxon to taxon and context to context. Regarding the distribution of the elements by anatomical region, we grouped the bones by

1 Draşovean, Schier 2010, 166.
2 Schier, Draşovean 2004, 146.
3 These are only the mammalian bones that we have personally dealt with. Those from birds, reptiles, fish and invertebrates are in the study of Mrs. Cornelia Becker of Freie Universität in Berlin.
4 Schier 2014, 22, tab. 1, supplemented with not published data, courtesy of colleague Florin Draşovean.
5 Draşovean *et al.* 2017, 3–10.

categories A-E, according to their food importance. Group A includes the skull elements, Group B, the column (vertebrae and ribs), Group C, scapular belt, humerus radius, thus the proximal anterior limb, with high food value. Similarly, Group D includes the proximal part of the hind limbs (pelvic girdle, femur, tibia, fibula), also with high food value. Group E includes the distal parts of the limbs; usually they are either thrown away or worked (metapodials, phalanges)[6]. The data for that layer indicate a high predominance of the spine elements (35%), by contrast, the cephalic elements total about 18.6%. The distal parts of the limbs represent 25%. The splinters from the meaty parts of the limbs and belts, barely make together 21.3% (Table 2). Similar distribution, meaning numerous small elements (dentition, ribs, phalanges, metapodials) are typical of walked areas, spaces between dwellings, ditches and foundations of the dwelling structures. Only in the fortification trenches is there a different anatomical distribution of the bones, given the prevalence of waste from meaty body parts, especially from large animals (cattle, red deer). The 152 cattle bones are from at least six or seven specimens. According to the dentition, a 12–18 month old individual was identified (M_2 in the crypt)[7], another of 18–24 months (M1 erosion – h)[8] and two of 6.5–9 years (M_3 erosion – j). Based on other skeletal elements, we identified a foetus (half-canons not fused), one under 15–20 months and one about 3–4 years. The 33 pig fragments come from a specimen under 10–12 months, another of 10–12 months and one under 6 months[9]. The 36 ovicaprid bones originate in two goats, slaughtered under 6–8 months and 8–14 months, and two sheep, 18–24 months and 4–6 years old. In addition, we have an animal aged between 4–6 months[10]. Thus the remnants of juvenile and subadult specimens predominate. Three dog bones are splinters from a proximal tibia, an unfused ulna and a metapodial. There are 23 fragments from at least four red deer, aged 4–6 months (M_1 in eruption)[11], 12–14 months (I_1 just changed), 24–26 months (P_4 in the crypt), and an adult over 3–4 years. The seven bones attributed to the roe deer come from a specimen over 15–18 months. The six hare bones belong to an adult; a tibia fragment comes from an adult boar. Only nine bones have traces of burning, varying degrees (from red stains to calcination). One proximal cattle phalanx emphasizes two fine cuts due to animal skinning.

Table 1. Frequency of species in the stages 5 and 4a.

	St. 5		**St. 4b/ H4b–1**	**St. 4 (4a)**	
Species	NISP	%	NISP	NISP	%
Bos taurus	152	58.24	7	39	58.21
Sus s. domesticus	33	12.64	2	5	7.46
Ovis/Capra	36	13.79	2	10	14.93
Canis familiaris	3	1.15			
Domesticates	224	85.82	11	54	80.6
Cervus elaphus	23	8.81	3	5	7.46
Capreolus c.	7	2.68		2	2.98
Sus s. ferrus	1	0.38		1	1.5
Lepus europaeus	6	2.3		5	7.46
Wilds	37	14.18	3	13	19.4
Determined	261	100	14	67	100
Bos/Cervus	51		11	13	
Sus sp.	4				
Splinters	127		3	40	
Total sample	443		28	120	

6 With high food value (proximal limb parts), medium (column), reduced or not (head, distal limb parts), *apud* Reitz, Wing 2008, 217–219.
7 Higham 1967, 84–107; Schmid 1972, 77.
8 Grant 1982, 91–108.
9 Zeder *et al.* 2015, 135–150.
10 Higham 1967, 84–107
11 Brown, Chapman 1991, 94

Table 2. Anatomical distribution of bones in the st. 5 and 4a.

Species	**Cattle**		**Pig**		**Sheep**		**Red deer**		**Roe deer**		**Boar**		**Hare**		**Dog**
St.	5	4a	5	4a	5	4a	5	4a	5	4a	5	4a	5	4a	4a
Neurocraniu/ ossa corni	11	1	4		1	1	2	2	2						
Viscerocr.	4	1													
Dentes sup.	2	2													
Mandibula	7	3	1		5		5								
Dentes inf.	2	1			1	1	2								
Atlas									1						
Vertebrae	11	4		1	3	3	2						1		
Sacrum	2	1													
Costae	28	11	18	3	14	1	5	1					4	1	
Scapula	5	1	2											1	
Humerus	7	1	2	1	4	1		1							
Radius	5		1		1										
Ulna	4		1												1
Carpalia	5														
Metacarpus	8	2					1			2		1			
Pelvis	3		1		1										
Femur	8	1	2		1				1					1	
Patella							1								
Tibia	4	2			3						1				1
Talus	2	2													
Calcaneus	2				1										
Tarsalia	7	1					3								
Metatarsus	7	1			1	2	1						1		
Phalanx 1	12	1				1									
Phalanx 2	3						1	1	1						
Phalanx 3	1	2							1						
Metapodialia	2	1	1						1					2	1
Total	152	39	33	5	36	10	23	5	7	2	1	1	6	5	3

Building stage 4b

One of the most representative housing structures discovered at the tell of Uivar is H4b–1 (Feat 5420). It consists of four rooms and a corridor located on the ground floor and another three rooms upstairs[12]. Out of the 28 bone fragments found in pits and foundation ditches, 11 fragments come from domesticated species and three from game; another 14 fragments are undetermined, from bovines or red deer. Four ribs, a vertebra, a metacarpal bone, and a distal tibia originate from cattle, suggesting a subadult specimen. From the pig we determined a rib head and a vertebra; from a sheep a rib and a mandible of a 6–12 month old animal. The three roe deer bones are a vertebral fragment, a jawbone, and a fragment from the skull of a subadult. The small number of pieces recovered from this dwelling can be explained by the fact that, before the construction of the H4a–1 dwelling (from the next horizon) the terrain would have been cleaned and the bones disposed of elsewhere to sanitize the space. The aforementioned bones gathered from pits and foundation ditches, are small fragments.

Table 3. Frequencies of species in the st. 3c, 3d.

Houses	**H3f–1**				**H3f–1a**			
Species	NISP	%	NMI	%	NISP	%	MNI	%
Bos taurus	71	3381	5	19.23	31	25	3	13.04
Sus s. domesticus	32	1524	4	15.38	13	10.48	4	17.39
Ovis/Capra	26	1238	5	19.23	22	17.74	4	17.39

12 Schier 2014, 25.

Houses	H3f–1				H3f–1a			
Domesticates	129	6143	14	53.84	66	53.22	11	47.82
Cervus elaphus	18	857	2	7.69	14	11.29	2	8.7
Capreolus c.	12	571	2	7.69	13	10.48	2	8.7
Sus s. ferrus	37	1762	4	15.38	19	15.32	2	8.7
Bos primigenius	8	381	1	3.85	7	5.65	2	8.7
Lepus europaeus	3	1.43	1	3.85	1	0.81	1	4.34
Felis silvestris					3	2.42	2	8.7
Martes martes	2	0.95	1	3.85				
Meles meles					1	0.81	1	4.34
Lutra lutra	1	0.48	1	3.85				
Wilds	81	38.57	12	46.16	58	46.78	12	52.18
Determined	210	100	26	100	124	100	23	100
Bos sp.	7				2			
Bos/Cervus	12				9			
Ovic/Capreolus	5				4			
Sus sp.	3				4			
Ribs	42				39			
Splinters	66				58			
Total sample	345				240			

	H3f–2				Total houses			
Species	NISP	%	MNI	%	NISP	%	MNI	%
Bos taurus	32	30.19	4	20	134	30.45	12	17.39
Sus s. domesticus	18	16.98	4	20	63	14.32	12	17.39
Ovis/Capra	11	10.38	2	10	59	13.41	11	15.94
Domesticates	61	57.55	10	50	256	58.18	35	50.72
Cervus elaphus	17	16.04	3	15	49	11.14	7	10.14
Capreolus c.	8	7.55	2	10	33	7.5	6	8.7
Sus s. ferrus	16	15.09	3	15	72	16.36	9	13.04
Bos primigenius	3	2.83	1	5	18	4.09	4	5.8
Lepus europaeus					4	0.91	2	2,9
Felis silvestris					3	0.68	2	2.9
Martes martes					2	0.45	1	1.45
Meles meles					1	0.23	1	1.45
Vulpes vulpes	1	0.94	1	5	1	0,23	1	1.45
Lutra lutra					1	0.23	1	1.45
Wilds	45	42.45	10	50	184	41.82	34	49.28
Determined	106	100	20	100	440	100	69	100
Bos sp.	2				11			
Bos/Cervus	2				23			
Ovic/Capreolus					9			
Sus sp.	1				8			
Ribs	12				93			
Splinters	90				214			
Total sample	213				798			

Building stage 4a

About 120 mammalian bones (Table 1) were recovered in the foundation ditches and postholes of three dwellings, H4a–1, H4a–2 and H4a–3. 39 pieces come from cattle (58.21%), ten from small ruminants (14.93%), pig, red deer and the hare, each one with five bones (7.46%). Two remains originate in roe deer (2.98%) and one in wild boar (1.5%). The predominant bones are from feet and spine (Table 2). These small elements „strayed" in the infill of foundation structures The cattle sample comes from a 6–7 month old specimen (M_1 erupting), another of 24–28 months (M_3 starting eruption), a specimen exceeding 18–24 months and another under 18–24 months. Bones from one pig under one year (a distal humerus not fused) were found. Sheep samples are distributed between three specimens aged less than 7–10 months (first phalanx not fused proximal), 12–16 months (M_2 erosion – b) and over 2–3 years (humerus fused proximal). The wild boar metapodial comes from a subadult individual. There is no age estimation for red deer, roe deer and hare. Eleven calcined bones and two with burning spots due to building fires werefound in that stratum.

Building stage 3c, 3d

From the perimeter of the constructions located in these levels (H3f–1, H3f–1a and H3f–2), 798 mammal bones were determined, of which 440 were identified completely. They come from about 69 individuals (Table 3). Approximately 345 fragments come from H3f–1, 240 fragments from H3f–1 and 213 fragments from H3f–2. A total of 345 bones were removed from the foundation ditches and the pitholes of H3f–1. Of these, 210 fragments were fully identified, the rest being small splinters and ribs. The percentage of domesticated species is 61.43% (as NISP), and of 38.75%, the hunted species. Among domesticates, cattle constitutes 33.81%, pig 15.38% and small ruminants 19.23%. Among wild species, wild boar predominates with 17.62%, followed by red deer with 8.57%, roe deer with 5.71%, aurochs with 3.81%, hare with 1.43%, marten with 0.95% and otter with 0.48%. The frequencies as MNI (individuals) generated lower percentages due to the small number of jaw bones. Overall, the proportion of teeth is only 16%, with other body parts predominating. The 71 bovine bones come from at least five individuals, killed at the following stages: 6–7 months, 17–18 months, 24–30 months, 36–42 months and above this limit (one individual). 32 pig bones come from four specimens, killed at about 3 months, 10–12 months, 12–14 months and over two years. Of the 26 small ruminant bones, six fragments come from two goats (under 16–18 months and 18–24 months), two fragments from sheep. 18 bones are not completely determined. Among the non-assigned bones (ovicaprids) bones from two juveniles were identified. The 12 roe deer elements come from two individuals, one of which was hunted and killed under 12 months and another in the second year of life in late autumn (October-November). The 18 fragments attributed to deer come from a juvenile and a large adult male. This includes a shoulder blade with GLP – 70.2 mm. Wild boar material (37 bones) is divided between four specimens, one under 24 months and three over three to four years. For an individual a 93.94 cm (93.94 cm) height was estimated. Three rabbit ribs were formed from fragments and a whole otter humerus was found. The presence of this aquatic element is linked to the rich hydrographic network of the Bârzava River in the surroundings of the settlement. From marten we identified a mandibular fragment and a shoulder blade, of which the dimensions are to be found in the annexes.

Above H3f–1 was discovered a new structure, H3f–1a. From the perimeter of this structure, we processed 240 household waste, of which 128 were totally determinable. Domestic mammals accounted for 53.22% of the remains compared to 46.78% of the hunted species. Cattle predominate here, but with a smaller percentage of only 25%, followed by ovicaprine with 17,74% and pigs with 10,48%. Of the hunted species, the boar has the largest number of bones, 19 fragments (15.32%), followed by red deer (11.29%) and roe deer (10.48%). The aurochs total 5.65%. Additional wild taxa are wild cat (2.42%) and badger (0.81%). About 31 cattle bones come from the skeletons of at least three specimens, slaughtered under 18–24 months, over 3–4 years, and 7–9 years old respectively. The 22 bones of small ruminants suggest about four individuals of 3–4 months, 5–6 months, 7–9 months and 21–23 months of age. We note the presence of young k k illed from the end of spring, during summer and autumn. The 13 pig bones belong to four specimens, two of them killed between 16–20 months, one under 12 months and another around two years. The boar remains belong to two animals, one of 2.5–3 years and another over 3 years. Based on a calcaneus with GL–100.5 mm, height of 96.47 mm estimated. The 14 bones of red deer come from two specimens one of 26–29 month and the other 4–5 years old. The roe deer bones come from two individuals, one hunted under 13–15 months and one above this limit. The aurochs material from an adult female is from a horn at the lower end of the metric scale and placed at the limit between cattle and wild cattle. However we assigned the item to a wild specimen, because other bones from aurochs were found in the same context. Two proximal radii come from two relatively robust wild cats. A hare rib, may be from the same individual as that in H3f–1. A right mandible was assigned to a robust badger, according to its measurements.

Table 4. Anatomical distribution of the bones in the stages 3d, 3c.

	Bos taurus			Sus. s. domesticus			Ovis/ Capra		
Houses	H3f–1	H3f–1a	H3f–2	H3f–1	H3f–1a	H3f–2	H3f–1	H3f–1a	H3f–2
Neurocraniu/ ossa cornii	3	1	2				2	2	1
Viscerocr.		3	2		1				
Dentes sup.			1				1	1	1
Mandibula	4	1	1	3	3	3	3	4	
Dentes inf.	2		2	1	1				1
Atlas	1	4							
Vertebrae	12	3	1	2				1	
Costae	15	7	5	6	2	1	4	7	2
Scapula	1	1		3		2	1		1
Humerus	3					1	1	1	
Radius	2	1	2	1	1		1	1	
Ulna	2	1		3	1	3			
Carpalia	1								
Metacarpus	1	1	2	1			2	2	
Pelvis	1		3	1	1				1
Femur	4	1	2	1	1	2	1		1
Patella		1							
Tibia	9	1	3	2	1	1	2		
Fibula				2		1			
Calcaneus	2					1			
Tarsalia	3	1	3						
Metatarsus	1	3	2	4		1	4	3	
Phalanx 1	3	1				1			2
Phalanx 2				1	1				
Phalanx 3						1			
Metapodalia	1		1	1			4		1
Total	71	31	32	32	13	18	26	22	11

	Cervus elaph.			Sus s. ferrus			Capreolul c.			Bos primig.		
Houses	H3f–1	H3f–1a	H3f–2	H3f–1	H3f–1a	H3f–2	H3f–1	H3f–1a	H3f–2	H3f–1	H3f–1a	H3f–2
Neurocraniu/ ossa corni			1	1		1	1				1	
Viscerocr.		1	1	2		1	1	1				
Dentes sup.			1			1						
Mandibula				2	1	2						
Atlas		1		1		1						
Axis	1			1								
Vertebrae	2	1	2	1					1	2		1
Costae	2		1	1	5	1						
Scapula	4		1	3	1	1	2	1				
Humerus		1		1	3		2					
Radius	1	1	1	5		2		1	1	1	2	
Ulna			2	3	3	1				1		
Metacarpus		1		6	1			3	1			
Pelvis	1	1	1	2	1			1				1
Femur				1			2	1	2			
Patella						1						
Tibia			1	3		1	1			1	3	
Fibula					1							
Talus						1			1			
Calcaneus				2	1	2		1		1		1

	Cervus elaph.			**Sus s. ferrus**			**Capreolul c.**			**Bos primig.**		
Tarsalia	2		2	1					1			
Metatarsus	1	6	2	1			3	3	1		1	
Phalanx 1					1					1		
Phalanx 2	2											
Phalanx 3	1	1	1							1		
Metapodalia	1				1			1				
Total	18	14	17	37	19	16	12	13	8	8	7	3

In the south-west corner of the surface S. I revealed a further structure, H3f–2. 213 mammalian bones, of which 106 identifiable were removed from the pits and foundation ditches of that construction. Species includes cattle (30.19%), domestic swine (16.98%), ovicaprids (10.38%), red deer (16.04%), wild boar (15.09%), roe deer (7.55%), aurochs (2.83%) and fox (0.94%). Overall, the bones of the wild species total 42.45%, a percentage as high as that of the other two structures. As MNI, cattle and pigs total 20% each, small ruminants 10%, red deer and wild boar 15% each, roe deer 10%, aurochs and fox 5%. The 32 cattle bones suggest at least four specimens, killed around 7–9 months, 24–26 months, 3.5–4 years, and 9–11 years. The bones of the pig (18 fragments.) belong to four specimens, aged 0–2 months, 7–8 months, 22–24 months and 36–42 months. The eleven small ruminant bones were assigned to at least two individuals, one slaughtered under 12 months and the second above this limit. Among the wild species predominate red deer with 17 bones, attributed to three animals, aged 15–16 months, 24–28 months and over 2–3 years. 16 fragments come from two boars, one adult and one subadult. The adult had a girth of 98.42 cm (astragalus with GL of 53.7 mm). Eight roe deer bones come from two individuals, one killed under 12–15 months and the other above this age. Three wild cattle bones come from an adult. From a fox, a humerus was identified with a GL of 127.5 mm, an average value for the epoch, and probably a female. It is impossible to specify whether its remains come from a hunted individual or a dead animal in its burrow.

The distribution of bony elements from the three contexts by anatomical regions (Table 4) indicates in the case of cattle, few cephalic elements (16.4%), the most from spine (35.8%) and few from fore limbs (9.7%). The percentage of spinal elements may have been somewhat higher taking into account the numerous ribs included in the grouping Bos/Cervus. In the case of pig, the distribution of skeletal parts is almost equable. The skull and foot bones (27–30.5%) predominate in sheep/ goat, with fewer axial elements (23.7%) and very few from meaty parts of the limb (18.5%). In the case of wild taxa, we note the presence of bones from all anatomical regions, meaning the animals were hunted, brought back and discarded somewhere in the perimeter of the settlement. In red deer we note a few splinters of skull, only 10.2%. Antlers may have been used for the making of tools or else frontal elements with attached horns may have been used as trophies. In contrast, the distal parts of the limbs, including metapods, phalanges total 40.8%. Overall, for all species, the low percentage of the elements from fleshy parts of the body, maximum 16–18% should be noted. Discrepancies in the distribution of body regions can be explained, primarily by the partial site research, many elements reaching other areas. On the other hand, the lower share of cattle bones, red deer (generally bones from large sized species), as against those of pigs, ovicaprids (small sized species) could also be related to the nature of the investigated context. We repeat, by periodically sanitizing the living spaces, the bones will have been thrown away elsewhere. Another possible explanation could be the incomplete site research.

Table 5. General distribution of the bones from the building stages.

Species	**St. 5**	**St. 4b/ H4b–1**	**St. 4a**	**St. 3c, 3d**	**Total**	**%**
Bos taurus	152	7	39	134	332	42.46
Sus s. domesticus	33	2	5	63	103	13.17
Ovis/Capra	36	2	10	59	107	13.68
Canis familiaris	3				3	0.8
Domesticates	**224**	11	**54**	**256**	**545**	**69.69**

Species	St. 5	St. 4b/ H4b–1	St. 4a	St. 3c, 3d	Total	%
Cervus elaphus	23	3	5	49	80	10.23
Capreolus c.	7		2	33	42	5.7
Sus s. ferrus	1		1	72	74	9.6
Bos primigenius				18	18	2.3
Lepus europaeus	6		5	4	15	1.2
Felis silvestris				3	3	0.38
Martes martes				2	2	0.26
Meles meles				1	1	0.13
Vulpes vulpes				1	1	0.13
Lutra lutra				1	1	0.13
Wilds	**37**	**3**	**13**	**184**	**237**	**30.31**
Determined	261	14	67	440	782	100
Bos sp.				11	11	
Bos/Cervus	51	11	13	23	98	
Ovic/Capreolus				9	9	
Sus sp.	4			8	12	
Ribs				93	93	
Splinters	127	3	40	214	384	
Total sample	443	28	120	798	1,389	

Description of the faunal remains from strata (no feature)

Stage 5

From this layer we analyzed 527 mammal bones, of which 310 clear were clearly identified and 217 fragments not specifically allocated (Table 6). Domesticated species amount to 81.61% (as NISP) as opposed to 18.39% wild species. Cattle predominates with 58.39%, the other taxa have small percentages: 13.22% ovicaprids, 10% pig, 9.35% red deer, 6.77% roe deer, 0.97% wild boar and 0.65% hare and aurochs. 181 bones come from eight bovines with the following slaughtering ages: three individuals under 12–18 months, one of 7–10 months, three 2–4 years old, one 4–6 year old and one over 9 years. So the cattle were killed throughout the year, depending on food requirements; about a quarter of the animals were kept many years, the others being exploited as immatures, obviously for meat. A cow metacarpal with GL of 203 mm provided a height of 122.41 cm, an usual value for that epoch. 31 pig bones come from three specimens, one of which was slaughtered between 6–12 months and two between 1–2 years. Of four presumed small ruminants, one specimen was 2–6 months old, a goat about 3–4 years and a sheep 4–5 years. One specimen is not securely identified. The three red deer were hunted between 8–12 months (meaning winter or early spring), between 30–36 months and over 3 years. Of the three roe deer, two were 8–12 months (most likely in the winter, early spring) and one at about 3–4 years. The boar individual was a large mature male with a girth of 107 cm. We found that the wild individuals were captured regardless of age, not to protect the genofond; hunting reflected what was available in the surroundings, especially during cold season.

Most bones in this layer come from the spine (36%), the other parts having a low presence, of 16–19%. In the case of cattle, splinters of metapodials and phalanges total 26.5%, ribs and vertebrae 28%, the rest of the body parts have a limited presence of 13–17% (Table 7). No horns were found in this context. The same imbalanced representation of body elements as in the case of the other species, should be noted and can be ascribed to the incomplete digging of the site. With regard to taphonomic aspects, we mention eight calcined splinters, deformed by fire or with burning spots on the ends. The complete cattle metacarpal has burning spots on the distal condyles. Other bovine pieces with burning traces are: a distal tibia, a metacarpal, two distal metatarsals and a scapula. The fire spots are more related to the preparation of the food by roasting than burning of the houses. The combustion spots are more related to the preparation of the food by roasting than to secondary combustion. Bones with cut marks are: a half-broken atlas fom aurochs and a cattle tibia with the distal part half-broken; also a cattle vertebra with cut marks on the body to remove the muscle.

Strage 4b

From this layer we identified few bones, only 133 elements, belonging to 13 domesticated and seven wild animals (Table 6). Bovines prevail with 40.62%, followed by ovicaprids with 18.75%, pigs with 12.5% and dogs with 1.04%. The wild species total 27.09%, among them, the red deer and the wild boar make up 6.25% each and roe deer 12.5%. Other wild species identified are the hare and probably the wolf, with 1.04% each. 39 bones come from five cattle aged 3–6 months (Pd_4 in erosion – b), 16–18 months (M_2 in eruption), 28–30 months (M_3 just erupted), 4–5 years (proximal tibia with visible suture) and over 4–5 years. From context 019/ 627A, about 100 small calcined splinters were collected. They come from a humerus and a proximal tibia of bovine, over 4–5 years old. 12 bones come from eight pigs culled as follows: two below one year, three between 12–18 months, two between 18–24 months and one between 5–7 years. A talus and phalanx are calcined. The 18 small ruminant bones belong to a lamb, killed under 3–4 months, a sheep of 18–24 month, one goat over one year old. A femur with epiphyses in fusing, from a sheep of 18–24 months suggests a height of 50.48 cm. One metapodial and its centrotarsal are calcined and a second metapodial has traces of working. A distal humerus with Bd / Dd – 25/20 mm comes from a small dog. From wolf comes another distal humerus with Bd/ Dd of 32.5/ 21.5 mm. 12 bones belong to a roe deer of 12–14 month and another of 15 months (probably captured in summer). Only six fragments were attributed to the red deer, apparently from two specimens, one of which was subadult. The six boar bones come from a mature specimen.

Stages 3d, 3c

From those levels we determined 1,479 waste, from 44 domestic and 35 wild individuals. Cattle predominate with 24.12%, followed by pig with 20.02% and ovicaprids with 13.72% (Table 8). The dog amounts to 0.44%. The wild segment totals 41.7% of the bones, most of the bones belonging to wild boar (15.49%). The red deer registers 14.05%, followed by roe deer with 6.75% and aurochs with 4.53%. From fox we have five items (0.55%), two from hare (0.22%) and one from marten (0.11%). The existence of a moist environment with plenty of meadow vegetation, suitable for wild boar and pig feeding seems possible. The landscape also offered some forested spots suitable for red deer. Distribution by body regions (Table 9) highlights many bone elements from the distal parts of the limbs, in a proportion of 40% for cervids and 31% for bovines. The cephalic remains are numerous in pigs (42.5%), in the others species they do not exceed 14–26%. The elements from meaty segments do not exceed 20%. In summary, in this layer predominantly smaller elements, isolated teeth, ribs, metapodials accumulated, with the larger fragments being disposed of elsewhere.

Table 6. Distribtion of species in st. 5, 4b (no feature).

	St. 5				St. 4b			
Species	**NISP**	**%**	**NMI**	**%**	**NISP**	**%**	**NMI**	**%**
Bos taurus	181	58.39	8	33.33	39	40.62	5	20.83
Sus s. domesticus	31	10	3	12.5	12	12.5	8	33.33
Ovis/Capra	41	13.22	4	16.67	18	18.75	3	12.5
Canis familiaris					1	1.04	1	4.17
Domesticates	**253**	**81.61**	**15**	**62.5**	**70**	**72.91**	**17**	**70.83**
Cervus elaphus	29	9.5	3	12.5	6	6.25	2	8.33
Capreolus c.	21	6.77	3	12.5	12	12.5	2	8.33
Sus s. ferrus	3	0.97	1	4.17	6	6.25	1	4.17
Bos primigenius	2	0.65	1	4.17				
Canis lupus					1	1.04	1	4.17
Lepus sp.	2	0.65	1	4.17	1	1.04	1	4.17
Wilds	**57**	**18.39**	**9**	**37.5**	**26**	**27.09**	**7**	**29.17**
Determined	310	100	24	100	96	100	24	100
Bos/Cervus	58				10			
Splinters	159				27			
Total sample	527				133			

Table 7. Anatomical distribution of the bones in the Stage 5 (no feature).

Bones	Cattle	Pig	Ovic.	Red deer	Roe deer	Boar	Aurochs
Neurocraniu/ ossa corni	9		8	2	2		
Viscerocr.	1	3		2	1		
Dentes sup.	2		1				
Mandibula	15	2	1	4	3		
Dentes inf.	2	1					1
Atlas	1						1
Axis	2						
Vertebrae	15	1	2	3			
Sacrum	1			1	1		
Costae	30	13	20	4	5	2	
Scapula	6	2		2	1		
Humerus	12	3	3			1	
Radius	7	2		1	2		
Ulna	4	3		2			
Carpalia	2						
Metacarpus	10		1				
Pelvis	13						
Femur	7	1	2				
Fibula	9			1	2		
Calcaneus	3						
Tarsalia	5		1	3	3		
Phalanx 1	6						
Phalanx 2	4		1		1		
Phalanx 3	6						
Metapodalia	8			4			
Total	1		1				

About 218 cattle bones come from eleven individuals slaughtered as follows: three under one year, one around 16–17 months, five between 2–4 years, one between 4–6 years and another over 9 years. In other words, 80% of the specimens are young and subadult with few mature specimens. The 181 pig bones come from 18 individuals as follows: eight below one year, seven between 1–2 years, and three between 2–3 years. So exploitation targeted the subadult animals, probably between 1–2 years, reaching a certain weight suitable for slaughter. From ovicaprids 124 fragments were identified, of which nine were from sheep, eight from goat and 107 not specifically identified. Based on them, thirteen individuals were presumed, slaughtered as follows: six between 0–6 months, one between 6–12 months, three between 1–2 years, one between 2–3 years, and two between 4–6 years. Basically, the juveniles and subadults dominate with 77%, animals kept for a long time being few. Four bones belong to a small dog, including an incomplete skull, of which the neurocranium, the occipital and the maxilla are preserved. A slightly larger shoulder blade comes from another, more robust specimen. 140 boar bones belong to 13 individuals, only two being juvenile and subadult, the rest adults. On some tarsals and metapodials, a withers height variation of 88.53–106.36 cm was estimated, with an average of 97.2 cm (N = 8). There are bones from at least two or three males, over one meter tall. Based on canines, three males and two females were identified. 127 small fragments come from eight red deer, with the following ages: one of 4–6 months (hunted at the end of the summer), another 16–18 months (by fall), an animal of 30–36 months, two of 3–4 years and three over 3–4 years. The roe deer sample was assigned to a juvenile specimen (captured during summer), another of 6–8 months (captured during fall), another specimen killed around 12–15 months (warm season) and two adults of 3–4 years and 5–6 years. The 41 aurochs' bones come from three mature and one subadult (30–36 months) specimens. From a hare, one calcaneus and a rib were identified, and from marten, an edentate mandible. Five mandibles belong to three adult foxes. None of these samples has revealed any traces of cutting, but a pig skull was cut to remove the brain. 36 bones have traces of fire, four of which are calcined, three have black spots, the rest being reddish. A suid radius is deformed by fire.

Table 8. Frequencies of species in the stages 3d, 3c (no feature).

Species	NISP	%	MNI	%
Bos taurus	218	24.12	11	13.92
Sus s. domesticus	181	20.02	18	22.78
Ovis/Capra	124	13.72	13	16.46
Canis familiaris	4	0.4	2	2.53
Domesticates	527	58.3	44	55.7
Cervus elaphus	127	14.05	8	10.13
Capreolus c.	61	6.75	5	6.33
Sus s. ferrus	140	15.49	13	16.46
Bos primigenius	41	4.53	4	5.06
Vulpes v.	5	0.55	3	1.26
Martes martes	1	0.11	1	3.8
Lepus sp.	2	0.22	1	1.26
Wilds	377	41.7	35	44.3
Determined	904	100	79	100
Bos/Cervus	57			
Ovis/Capreolus	11			
Sus sp.	16			
Ribs	124			
Splinters	367			
Total sample	1,479			

Table 9. Anatomical distribution of the bones in the stages 3d, 3c (no feature).

	Cattle	Pig	Ovic.	Red deer	Roe deer	Boar	Aurochs
Neurocraniu/ ossa corni	8	9	4	2	1	7	
Viscerocr.	9	34	1	5	3	12	
Dentes sup.	4	4	6	3		2	
Mandibula	10	28	20	7	6	8	
Dentes inf.	4	2	1	1	1	2	
Atlas	5	1	1			3	1
Axis	2	1				1	
Vertebrae	21	2	6	17		10	5
Sacrum	1					1	
Costae	12	14	16	1	3	11	1
Scapula	10	9	5	3	3	16	1
Humerus	21	5	10	3	4	8	4
Radius	5	13	13	8	7	7	4
Ulna	6	6		2	2	5	
Carpalia	2						
Metacarpus	9		9	9	9	9	4
Pelvis	6	12	2	6	1	3	4
Femur	7	8	1	7		3	3
Patella						1	1
Tibia	18	8	11	11	6	9	4
Fibula		4				1	
Talus	4			2	1	1	2
Calcaneus	3	1	3	2		8	1
Metatarsus	11	3	9	19	11	6	1
Tarsalia	8	4		5		3	
Phalanx 1	11	5		5	1	1	3
Phalanx 2	7	3		5	1		
Phalanx 3	6	3		1			2
Metapodalia	8	2	6	3	1	2	

Total	218	181	124	127	61	140	41

Summarizing data from stratum (Table 10) we highlight the following: the proportion of domestic species accounts for 64.89%, compared to wild species 35.11%. Cattle totals 33.44%, followed by pigs with 17.1% and small ruminants with 14%. Of the wild species, red deer predominates with 12.37%, the boar amounting to 11.37%. The roe deer reaches only 7.16% and the aurochs 3.3%. Generally, there are some differences between the percentage of species in built structures and the culture layer. The rate of cattle drops by 10%, from 42.4% to 33.4%; the percentage of ovicaprids is the same in both situations; the pig share increases from 13% to 17% in the layer, also the share of the domesticated species increases by 5% in the layer. The red deer, wild boar and roe deer increase every by 2–3%.

Table 10. General distribution of the bones as NISP in cultural layer (no feature).

Species	St. 5	St. 4b	St. 3c, 3d	Total	%
Bos taurus	181	39	218	438	33.44
Sus s. domesticus	31	12	181	224	17.1
Ovis/Capra	41	18	124	183	13.97
Canis familiaris		1	4	5	0.38
Domesticates	253	70	527	850	64.89
Cervus elaphus	29	6	127	162	12.37
Capreolus c.	21	12	61	94	7.16
Sus s. ferrus	3	6	140	149	11.37
Bos primigenius	2		41	43	3.29
Lepus europaeus	2	1	2	5	0.38
Martes martes			1	1	0.08
Vulpes vulpes			5	5	0.38
Canis lupus		1		1	0.08
Wilds	57	26	377	460	35.11
Determined	310	96	904	1,310	100
Bos/Cervus	58	10	57	125	
Ovic/Capreolus			11	11	
Sus sp.			16	16	
Ribs			124	124	
Splinters	159	27	367	553	
Total sample	527	133	1,479	2,139	

To test the possible differences in the representation of the main taxa in the building stages and cultural layer, we applied a nonparametric test (CHi^2)[13]. There are numerous examples using this test in faunal analyses [14]. Statistical processing was done using the PAST software together with the related documentation[15]. Applying the χ^2 test gave a statistically high significant value (χ^2 = 23,28; p = .000; df–6); this suggests that there are significant differences between observed and expected frequencies only for cattle and pig; basically the distribution of the main taxa is alike in both contexts, except that cattle have more bones in the housing area than would be expected and pig had fewer. In the cultural layer, fewer bovine remains were found than predicted, but slightly more than predicted of pig. The differences are insignificant in the case of the other species (tab. 11).

Ageing data

Summarizing data of slaughter profiles from each level: the cattle slaughter profile indicates, 22.5% of individuals below one year, especially between 6–12 months (17.5%), 12.5% between 1–2 years, a large rate between 2–4 years (37.5%), and 27.5% over four years (Fig. 1). Few calves were killed below six months, the slaughter rate intensified over six months. In the second year of life the killings

13 Opariuc-Dan 2011, 36–42.

14 Pazan 2013, 14–20; Kovács, Gál 2009, 151–157

15 Hammer 2016, 78–79.

were few, and targeted males; between 2–4 years, the rate was maintained, probably targeting males and barren cows. However, few individuals were exploited up to 9–11 years. Based on advanced data, cattle were mainly used for meat and secondarily for milk and labor.

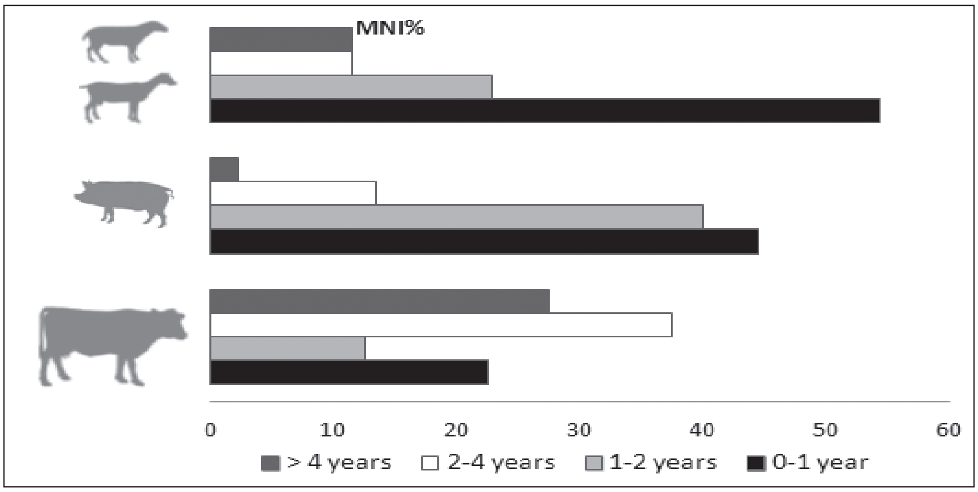

Fig. 1. Slaughter profiles of domestic species at Uivar (buildings+cultural layer).

The small ruminants age profile indicates that, 54.29% of the specimens were slaughtered in the first year of life, of which 17% were under six months. Between 1–2 years, the proportion drops to 22.85%, and between 2–4 years it is only 11.43% and between 4–6 years it is only 11.43% for each age group. Practically, about 77% of the presumed individuals were exploited in the first two years of life. Exploitation targeted the juveniles and subadults primarily for meat, and also to obtain a higher milk production. The percentage of animals exploited for many years (for reproduction) is reduced at 11.4%. Exploitation of the wool cannot be ruled out. No seasonal transhumance was revealed, the slaughtering being done throughout the spring and summer. It should also be noted that goats constituted almost half of the flocks. In the case of pigs, of the 45 animals identified by teeth, 44.44% were sacrificed up to one year, about 40% up to two years, 13% between 2–4 years and 2% at an advanced age. In the last case, we are talking about breeding individuals. So, in the first two years of life, 80% of the presumed individuals was exploited. The favourable environmental conditions would maintain a natural increase in the herd, without much effort from the community.

Table 11. Chi^2 test on bones from building stages and stratum.

	Buildings		**Cultural layer**	
Szakálhát habitation	Observed	Expected	Observed	Expected
Bos taurus	**332**	**284**	**438**	**486**
Sus s. domesticus	**103**	**121**	**224**	**206**
Ovis/Capra	107	107	183	183
Cervus elaphus	80	89	162	153
Capreolus c.	42	50	94	86
Sus s. ferrus	74	82	149	141
Bos primigenius	18	23	43	38
CH2 – 23,284; p- .000; df–6				

A high ratio of subadult red deer specimens was found (45%). Probably the inhsbitants captured what was available in the environment. In the case of roe deer, 17 specimens were identified, of which 10 were under two years, of which three under one year and three were over 3–4 years old. Four specimens were slaughtered over 10–15 months, although the exact age cannot be specified. We note the predominance of young and subadult specimens at 58.8%, meaning rather abnormal hunting, either to reduce an increased population growth, or protect crops or to meet immediate food requirements.

In the case of boar, the ratio of subadult to adult animals is 50: 50. Based on the post-cephalic elements, at least nine aurochs were identified, one of which seems subadult, all others being adults and mature.

Metric evaluations

Based on the metric data (found in the appendix) it appears that, a relatively robust, medium-sized cattle population[16] was exploited in the Uivar area with some specimens close to the aurochs. This does not exclude any accidental interbreeding with the wild species[17], which indicates unrestricted grazing in certain periods of the year. For a single cow, a height at the wither of 122.4 cm (Matolcsi) was estimated, based on a metacarpal with GL–203 mm, originating in the layer 5 (019/ 758A). A very similar value is mentioned in the Szakálhát settlement at Szarvas–1 (123.9 cm)[18]. From house H3f–1 comes a frontal with a pair of horns (one of them is damaged in length) with a length of about 525 mm and base dimensions of 80/ 67.5 / 233.5 mm. The distance between the base of the horns is 184 mm. The interfrontal line is flat, the horns stretch out sideways, twisting to the front and upwards, walls are thick, about 7 mm. The metric data are quite small, between the limit of the two populations, so the assigning to one species is relative. For example, comparing with similar horn cores from the late Neolithic sites from Hungary[19], my measurements are smaller, but they are found in the Divostin[20] database. It is worth noting that, in material from Gomolava, a horn with dimensions of 79,5/ 64,5/ 230 mm is assigned to a domestic bull[21].

Referring to ovicaprids there are no data on the height at the withers, but small animals are supposed as stated by some measurements. From layer 3c comes a prisca she-goat horn, with the dimensions of the base 39/ 26,5/ 113 mm. The cross-section is plane-convex, slightly arched. The ewes were horned, although whole pieces were not found except for some splinters. Thus, a sheep frontal of this type was collected from layer 3c (014/ 716A). The goats have a more robust skeleton suggested by higher dimensions than sheep. Estimates of height at withers cannot be made for small ruminants, but there is some literature on this item. Thus, for the sheep exploited at Parța-tell I (level 6) a hight of 56.7 cm (Țalkin) was estimated[22]. On the sheep bones from Szarvas 1, two withers heights of 59.5 cm and 63.2 cm were calculated[23]. The values from Vinča (47.8–56.04 cm, M = 52.5 cm)[24] fall within the same size range. For other individuals from Vinča, values of 50.8 cm, 52.27 cm and 55.18 cm are estimated [25]. An older study on sheep size over several epochs shows that for zone A (Euro-Asian regions)[26], before 2000 BC, a sheep height variation of 57.6–63.1 cm with an average of 59.2 cm (N = 135) was estimated[27]. Thus, our metric evaluations, including those on Vinča C or their contemporary sites ares placed in the lower variation register, just below the average of zone A.

For domesticated swine, we do not have data on stature and body conformation due to the slaughter of individuals before the skeleton is fully developed. For wild boar, sizing is widely reported, providing a consistent data base. A lot of bones included in the wild swine grouping have lower metric data. Interbreeding cannot be excluded. For wild boar there was a 88.53–107.1 cm height variation with an average of 98.1 cm (N = 17). For the domestic species, we mention a single girth value of 62.1 cm in the level 6 of Parta-tell I[28], and 61.7–69.9 cm, with an average of 65.6 cm (N = 12) at Vinča-Belo Brdo[29]. Generally, for the Vinča C levels from Uivar we estimated a variation of the pig girth of

16 The metric data characteristic of the mean variation range prevails in the material at this level.
17 Counterarguments against the „Fever of Domestication" theory in the late Neolithic in Vörös 1994, 178.
18 Bökönyi 1986, 91.
19 Bartosiewicz 1999, 115, appendix 1; Bokonyi 1960, 121.
20 Bökönyi 1988, 437, 10, tab. 17.
21 Clason 1979, 88.
22 El Susi 1995, 36.
23 Bökönyi 1986, 91.
24 We have estimated the waist variation based on the data from Dimitrijević 2006, 264, tab. 5.
25 Bökönyi 1990, 51.
26 Germany, Hungary, the former Yugoslavia, Greece, northern Turkey are included.
27 Lasota-Moskalewska *et al.* 1998, 325.
28 El Susi 1995, 36.
29 The calculation was based on data from Dimitrijević, 2006, tab. 4, 263.

64–76 cm. The limits of the variation are quite broad, either because of sexual dimorphism or in the case of some robust and taller individuals, closeness to the wild population.

The dog material is strongly fragmented, especially in the houses' area. From layer 3c comes an incomplete skull, including the neurocranium and maxilaries. The piece originates in a small-sized dog. The neurocranium was cut/opened (as in most cases), probably to remove the brain. According to some measurements on long bones, the specimens were of small and medium size, with small ones most prevalent.

Conclusions

About 6,757 mammalian remains were collected from the perimeter of the edifices from S. I-III, of which 1,389 from the Szakálhát levels, 3,210 from the Vinča C1 levels and 2,158 from the Vinča C2 levels[30]. Table 12[31] shows the results of the Chi^2 test on the samples from the three levels. Firstly the data of Szakálhat and Vinča C1 samples were compared resulting in a χ^2 = 163.13 (p = .000; df–6); the value suggests significant differences between the observed and expected values for cattle, ovicaprids, red and roe deer, Practically, these taxa mark the differences between the two cultural phases. There are no major differences between observed and predicted values for aurochs, boar and pig. Specifically, more cattle than predicted were recorded in the Szakálhát habitation compared with the Vinča C1. In contrast, ovicaprids and cervids' number is higher than predicted in Vinča C1. The husbandry of the earliest communities on the tell was heavily focused on cattle with reduced rate of hunting and other domestics.

Considering the report between Vinča C1 and C2 levels a value of χ^2 = 54,43 (p = .000; df–6) was revealed, meaning significant differences in the case of pigs, small ruminants and red deer. The differences between observed and expected values for bovine, wild boar, roe deer and aurochs are insignificant, and due to chance. It seems that the cattle rates do not show any significant shift in this comparison, its values being about the same in both Vincian phases. In Vinča C1 there are more pig and small ruminants bones than expected and fewer in Vinča C2. Also, there are fewer red deer recorded in Vinča C1 than Vinča C2. A slight extension of the pastures in Vinča C1, could be noted which is correlated with a lower number of red deer bones, meaning fewer forested areas. For Vinča C2, there may have been some extension of the forest, with a reduction in grazing areas. By the end of the Neolithic habitation of the tell, there is a significant increase in wild species rates, to over 40% (Fig. 2).

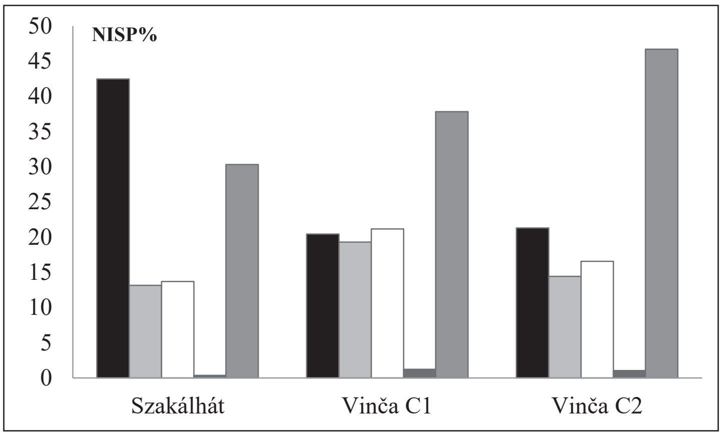

Fig. 2. Frequencies of species in neolitic levels at Uivar (buildings).

Table 12. Chi^2 test on samples from Szakalahat, Vinča C1, C2 from Uivar.

	Szakálhát		**Vinča C1**		**Vinča C1**		**Vinča C2**	
Building area	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.
Bos taurus	**332**	**211**	**360**	**481**	360	367	331	324

[30] Unpublished data.
[31] With bold we passed the relevant values.

	Szakálhát		Vinča C1		Vinča C1		Vinča C2	
Sus s. domesticus	103	135	340	308	**340**	**300**	**224**	**264**
Ovis/Capra	107	146	373	334	373	335	257	295
Cervus elaphus	80	101	251	230	251	317	345	279
Capreolus c.	42	78	213	**177**	213	204	170	179
Sus s. ferrus	74	74	169	169	169	178	166	157
Bos primigenius	18	11	17	24	17	22	24	19
Test	CH^2 – 163,12; p- .000; df–6				CH^2 – 54,43; p- .000; df–6			
Stratum	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.
Bos taurus	438	307	220	351	220	336	649	533
Sus s. domesticus	224	249	310	285	**310**	**226**	**276**	**360**
Ovis/Capra	183	287	431	237	431	312	378	497
Cervus elaphus	162	158	177	181	**177**	**298**	**594**	**473**
Capreolus c.	**94**	**122**	**167**	**139**	167	141	197	223
Sus s. ferrus	149	133	135	151	135	132	208	211
Bos primigenius	43	37	36	42	36	31	44	49
Test	*CH^2 – 197,4; p- .000; df–6*				*CH^2 – 277,94; p- .000; df–6*			

About 7,851 mammalian bones were determined from stratum, of which 2,139 from the Szakálhát layer, 2.223 from the Vinča C1 layer and 3,489 from the Vinča C2 layer. Applying the Chi^2 test on Szakálhát and Vinča C1 samples (χ^2 = 197.4; p = .000; df–6) differences in cattle, ovicaprids and roe deer samples were recorded, confirming the results from the buildings' area (Table 11). So, in the former Neolithic sample, there were more cattle bones and fewer from ovicaprids and roe deer than in Vinča C1. Applying Chi^2 to the Vinča C1 and Vinča C2 lots (no feature) we noticed significant differences between the values of the contingency table (χ^2 = 277,94; p = .000; df–5) for all domesticates and red deer. Specifically, in Vinča C1, cattle and red deer are fewer than in Vinča C2; whereas pigs and ovicaprids are more numerous in Vinča C1 than Vinča C2. Therefore, in the Vinča C1 settlement, pig, sheep and goats were the species predominantly exploited with few wild species. The small-sized species provided meat throughout the year preserving the cattle. In the Vinča C2 settlement, cattle and red deer were predominantly exploited, as opposed to other species. The values expressed in the contingency table (Table 12) confirm the percentages recorded for the main taxa (Table 13). According them, in the Szakálhát settlement the share of domestic species is about 69.6%, decreasing to 62% in Vinča C1 and 53% towards the end of the tell (Fig. 3). Cattle reach the maximum percentage (42.4%) in the first phase, reducing to 20.45% in the second, keeping the same in Vinca C2[32]. The proportion of pig has an upward trend, from 13% to 19%, reducing to 16% toward the end of the neolithic settlement of tell. The ovicaprid rate increases substantially, from 13.6% at the onset, to 21% in Vinča C1, down to 16.5% in Vinča C2. Parallel with the intensification of the hunting, that reaches a maximum (46.6%) in the Vinča C2 habitation, the rate of red deer increases to 22–25%, exceeding the cattle rate. Summarising, the Szakálhát' economy was focused on large ruminants, pigs, sheep/ goat and hunting in secondary. The Vinča C1 dwelling is characterized by the equivalent exploitation of the three groups of domestic species, with a significant component of wild taxa, especially cervids. In the Vinča C2 phase, the exploitation of red deer is the dominant note, with a much lower rate of main domestic species. Perhaps, some climatic changes happened toward the end of the Neolithic habitation that would have impacted on the distribution and density of local fauna. Some palinological research in Central Hungary revealed a tendency to cooling at the end of the Neolithic, which continued during the early Copper Age. It was accompanied by an expansion of deciduous forests, with predominance of beech; at the beginning of the Copper Age the climate became chilly and damp, the cooling seems to have been accentuated in the second part of the Chalcolithic[33]. Comparing the results from the Szakálhat habitation of Uivar and Parţa-tell I (level 6) we did not identify any similarities. Parţa is remarkable for its high proportion of wild species, about 55.4%, concentrating on boar exploitation (24.8%). Domesticates total only 44.6%, of which cattle comprise 21.3%, pig 16.3% and ovicaprids 6.7%[34].

32 We repeat, these percentages are valid for surfaces I-III; they may be different from general statistics per site.

33 Parkinson *et al.* 2010, 10.

34 El Susi 1995, tab 1, 24.

Similarities concern only the metric evaluations of the species. In a synthesis on neo-eneolithic fauna in eastern Hungary[35], it is shown that in the late Neolithic the hunting rate increases significantly to 42%, compared with only 11%, the mean in the early and middle Neolithic. „The intensive exploitation of wild animals is associated with multi-layer settlements of the late Neolithic”[36]. Thus, on twelve late Neolithic sites, the general statistics show an average rate of cattle of 30%, the ovicaprids and the pig shares oscillate around 13–14%, the red deer is the dominant element in the wild segment, accounting for 17%. Boar constitute 11% and aurochs 16%. Comparisons with the Vésztő-Mágor site (based on 224 Neolithic specimens) suggest some similarities in percentage ratios. Thus, cattle prevail with 37%, the pig and ovicaprid share amounting to 13–14%. Hunting is quite well represented with over 34% at Vésztő-Mágor and 30–35% at Uivar. Therefore some similarities with the Szakálhát levels from Uivar become obvious. Obviously there are peculiarities for each site, resulting from the size of the sample, the natural resources provided by the environment and the possibilities of their exploitation.

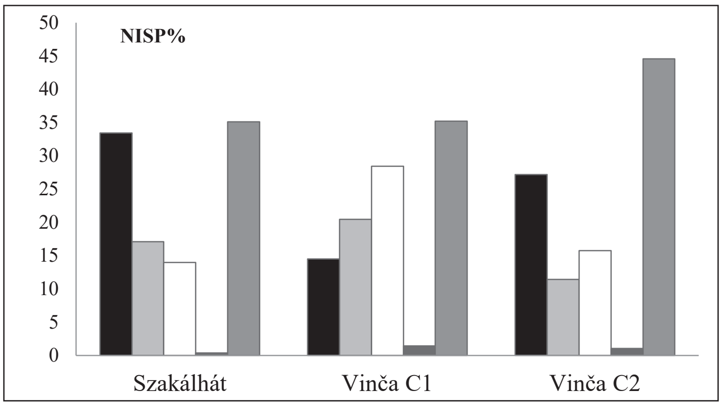

Fig. 3. Frequencies of species in neolitic levels at Uivar (cultural layer).

Table 13. Frequency of species in the Neolithic levels at Uivar.

	Buildings			**Cultural layer**		
Level	Szakálhát	Vinča C1	Vinča C2	Szakálhát	Vinča C1	Vinča C2
Bos taurus	42.46	20.44	21.32	33.44	14.5	27.18
Sus s. domesticus	13.17	19.31	14.42	17.1	20.44	11.44
Ovis/Capra	13.68	21.18	16.55	13.97	28.41	15.77
Canis familiaris	0.38	1.25	1.03	0.38	1.45	1.03
Cervus elaphus	10.23	14.25	22.22	12.37	11.67	25.03
Capreolus c.	5.37	12.1	10.95	7.16	11	8.28
Sus s. ferrus	9.46	9.6	10.69	11.37	8.9	8.49
Bos primigenius	2.3	0.97	1.55	3.29	2.38	1.84
Alte sp.	2.95	0.9	1.27	0.92	1.25	0.94
Specii domestice	69.69	62.18	53.32	64.89	64.8	55.42
Specii sălbatice	30.31	37.82	46.68	35.11	35.2	44.58

Undoubtedly, the forthcoming publication of the late Neolithic samples from Uivar will open up another perspective for the interpretation of the present data. Then we will have a much clearer picture of what is meant by the exploitation of animals from the late Neolithic and the Eneolithic epoch in the Banat Plain, which could define the features, and confirm or refute what has been published in the archaeological literature to date.

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[35] Bartosiewicz 2005, 51–63.
[36] Bartosiewicz 2005, 60.

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Appendix

Date metrice/measurements

Coarne/Horn cores						
Context	**OC**	**BA**	**BB**	**BC**	**M/F**	**Taxon**
H3f–1a		80	67,5	233,5	F	Bp
H3f–1a	525	80	67,5	233,5	F	Bp
SI/3c		39	26,5	113	F	Capra
Neurocraniu						
Context	**29/Lţ. foramen**	**30/H. fora-men**	**27/lţ. condilară**	**45/H occip.**	**Taxon**	
H3f–2	17,7	20,1	37,7		Capra	
SI/3c	30,2	38	68	144	Ss	
Maxilla						
Context	**P2-M3**	**M1-M3**	**M3**	**Taxon**	**Craniu**	**Canis f.**
SI/3c		89,5	34,1	Bt	Context	S I/3c
SI/3c			31,8	Bt	7/ Ak-F	82,4
H3f–2			33,7	Bt	23/ Ot.-Ot.	55,4
SI/3c			39,2	Bp	25/Lţ. la condili	31,7
SI/3c	109,4	63,7	28,7	Sd	27/Lţ. foramen	16,7
SI/3c		64	31,5	Sd	28/H. fora-men	14,8
SI/3c		65,1	30,1	Sd	29/Eur.-Eur.	52,2
SI/3c	132	81	39,8	Ss	38/ H. craniu	49,6
SI/3c		78	39	Ss	40/B.-Akr.	38,2
SI/3c		78,4	42	Ss		
SI/3c		82,8	44,1	Ss		
SI/3c		85	43	Ss		
Mandibula						
Context	**P1/2-M3**	**M1-M3**	**P1-P4**	**M3/M1**	**Taxon**	
SI/3c				35,1	Bt	
H3f–2				38,1	Bt	
H3f–2				39,3	Bt	
S I/3				38,5	Bt	
S I/4		93		40	Bt	
S I/5				43,5	Bp	
SI/3c	75,1	51,3		24,3	Capra	
SI/3c				23,6	O/C	
SI/3c	104	67			Sd	
SI/3c				37,6	Sd	
H3f–1a		82		44,5	Ss	
SI/3c		82,1		42,8	Ss	
SI/3c		83,1		43,1	Ss	
SI/3c		86,5		44,7	Ss	
H3f–1				41,7	Ss	
H3f–2				44,6	Ss	
SI/3c				45	Ss	
S I/3c	90			27,5	Canis l.	
S I/3c	67,6	40		16,2	Capreolus	
SI/3c	63,5	24,5		14,5	Vulpes	
SI/3c			33,5	14,5	Vulpes	
SI/3c			34,5		Vulpes	

SI/3c				14,5	Vulpes	
S I/3c		24,8		13,7	Vulpes	
H3f–1a	44,2	24	20,3	17,4	Meles	
Atlas				Axis		
Context	**H**	**BFcr**	**Taxon**	**Context**	**BFcr**	**Taxon**
H3f–1a	90		Bt	SI/3c	102,1	Bt
SI/3c	97,2		Bt	SI/3c	109,2	Bt
SI/3c		84	Bt	S I/3c	61,6	Ss
SI/5	105,5		Bp			
SI/3c		50	Sd			
SI/3c		50,2	Sd			
H3f–1		62,2	Ss			
SI/3c		67,5	Ss			
SI/3c		68,5	Ss			
SI/3c		69,5	Ss			
SI/3c		69,7	Ss			
H3f–2		70	Ss			
Scapula						
Context	**SLC**	**GLP**	**LG**	**Taxon**		
SI/3c	54,3	71,5	58,8	Bt		
SI/3c	54,5	76	60	Bt		
SI/3c	55,7	66,9	58,5	Bt		
SI/3c	82,7	100	81,5	Bp		
H3f–1	21,3			Sd		
H3f–1		35,3		Sd		
SI/3c	27,8	40,8	35,8	Ss		
SI/3c	29,1		36,7	Ss		
H3f–1	29,4	42,7	37	Ss		
SI/3c	29,8			Ss		
SI/3c	30	47,4	38	Ss		
H3f–2	31			Ss		
SI/3c	31,1	45,8	35,5	Ss		
SI/3c	31,5			Ss		
SI/3c	31,5			Ss		
H3f–1	31,8			Ss		
SI/3c	32,5	52,6	44,5	Ss		
SI/3c	32,8	42,4	35,7	Ss		
H3f–1a	33			Ss		
SI/3c	33,7	46,1	42,6	Ss		
SI/3c	34,2	42,8	43,4	Ss		
SI/3c	35	55,5	46,5	Ss		
SI/3c	37,5		39,5	Ss		
SI/3c	40,1	54,6		Ss		
SI/3c	44			Ss		
SI/3c	46,7	51	29,6	Ss		
H3f–1		48	42	Ss		
SI/3c		42,8		Ss		
H3f–1a	16,2	27,1	22,2	Capreolus		
S I/3c	17,7	28,9	23,1	Capreolus		
S I/3c	38,4	63,7	49,1	Cervus		
S I/3c	23,1	27,6	25,5	Canis f.		
SI/4a	7,5	15	12	Lepus		
H3f–1	12,5	13	7,8	Martes		
Humerus						

Context	GL/Bp	Bt	Bd	Dd	Taxon	
SI/3c		88,5	94,5	94,1	Bp	
SI/3c		96,4			Bp	
SI/3c		99,3	110,9	108,8	Bp	
SI/3c			33,5	35,2	Capra	
S I/5		27,5	29	25	Capra	
SI/3c		25,1	25,8	23,4	Ovis	
SI/3c		23,8	26,7	22,4	Ovis	
SI/3c		25,8	28,3	23,7	Ovis	
S I/5		30,5	38	37,5	Sd	
H3f–1a		38	57,3		Ss	
SI/3c		36	49,3	47,5	Ss	
SI/3c		36,7	45,8	52,1	Ss	
SI/3c		37,2			Ss	
SI/3c		37,6			Ss	
SI/3c		38	51,2	51,9	Ss	
SI/3c		42,5	52,5		Ss	
SI/3c			55	52,6	Ss	
SI/4b		19	25	20	Canis fam.	
SI/4b			31,5	21,5	Canis lupus	
S I/3c			25,8	27,3	Capreolus	
H3f–1			28,6	25,4	Capreolus	
H3f–1			30,8	27,8	Capreolus	
S I/3c			55	58,5	Cervus	
S I/3c			52		Cervus	
H3f–1			23	10	Lutra	
H3f–2	127,5/ 20,5		19	14,5	Vulpes	
Radius						
Context	**BFp**	**Bp**	**Dp**	**Bd**	**Dd**	**Taxon**
S I/5	79,5	86,5	44,5			Bt
H3f–1a	90	100,3	47,2			Bp
SI/3c			51,4			Bp
SI/3c				98	63	Bp
H3f–1					69	Bp
SI/3c		35,5	23,5			Sd?
SI/3c		37	25,5			Ss
SI/3c		37,1	24,1			Ss
H3f–1		38,2	26,4			Ss
H3f–1		38,3	27,5			Ss
SI/3c				35	24,2	Sd
SI/3c				39	27	Sd
SI/3c				48	31	Ss
SI/3c				43,6	30,1	Ss
S I/3c		25,2	16			Capreolus
S I/3c		26,4	14,4			Capreolus
H3f–2		27,4	16			Capreolus
S I/3c		27,7				Capreolus
S I/3c				25,5	18,4	Capreolus
S I/3c	53,5	56,5	28,5			Cervus
S I/5	54,5	57,5	29,5			Cervus
S I/3c	57,5	61	31			Cervus
S I/3c		63,2	27,5			Cervus
S I/3c				58,2	42	Cervus
H3f–1a		10,5	7,1			Felis s.

H3f–1a		11,2	8,4			Felis s.
Metacarpus						
Context	**Gl**	**Bp**	**Dp**	**Bd**	**Dd**	**Taxon**
S I/5	203	58	33,5	60,5	31	Bt
H3f–1a		53	35,2			Bt
H3f–2		55,2	30,5			Bt
S I/5		60	35			Bt
S I/5		60,5	36,2			Bt
S I/5		60,5	32,7			Bt
SI/4a		61	35,5			Bt
SI/3c		61	38,5			Bt
SI/3c		61	38,5			Bt
SI/3c		61,5	35,5			Bt
SI/3c		62	36,5			Bt
SI/3c		62,5	36			Bt
SI/3c		62,5	36,5			Bt
S I/5		61	35			Bt
SI/3c		70,8	40			Bp
SI/3c		70,4	38,9			Bp
SI/3c		83	44,8			Bp
SI/3c				50,1	33,8	Bt
SI/3c				57,1	34,8	Bt
H3f–1				68,3	37,8	Bt
S I/5				61,5	32	Bt
S I/6				62	35,5	Bt
SI/4a				66	37	Bt
H3f–2				25,4	15,3	Capra
SI/4a		21,5	17,5			Capreolus
SI/3c		23	17,1			Capreolus
SI/3c		23,3	17,7			Capreolus
S I/3c	43	33				Cervus
S I/3c	49,8	34,8				Cervus
S I/3c				51,8	33,4	Cervus
H3f–1a	54	38				Cervus
S I/3c	57,5	36,5				Cervus
Metatarsus						
Context	**Bp**	**Dp**	**Bd**	**Dd**	**Taxon**	
H3f–1a	47,5	49,5			Bt	
S I/5			60	34	Bt	
S I/5			60	34,5	Bt	
S I/6			65,5	36,5	Bt	
SI/3c			65,6	37,6	Bt	
H3f–1a			68,4	38,2	Bp?	
SI/3c			73,7	42	Bp	
SI/4a	19,5	19,5			Ovis	
S I/3c	21,7	23,7			Capreolus	
S I/5			26,5	17,5	Capreolus	
S I/3c	42,2	44,5			Cervus	
S I/3c	44	48,5			Cervus	
H3f–2	46,3	49			Cervus	
S I/5	43	48			Cervus	
S I/3c			49,3	34	Cervus	
Centrotarsal			**Femur**			
Context	**GL**	**Taxon**	**Context**	**Bp**	**Bd**	**Taxon**

S I/5	56,5	Bt	SI/3c	115		Bt
S I/5	58,5	Bt	SI/5		97	Bt
SI/3c	62	Bt	SI/3c		109	Bt
H3f–1	63,5	Bt	SI/3c	32		Sd
H3f–1	64,6	Bt	H3f–2		37,8	Sd
S I/3c	45,4	Cervus	SI/3c		59	Ss
			SI/3c		65,6	Ss
Pelvis			**Mc III**			
Context	**LA**	**Taxon**	**Context**	**GL**	**Tall**	**Taxon**
SI/3c	30	Sd	S I/3c	97,1	101,22	Ss
SI/3c	35,5	Sd	S I/3c	102	106,47	Ss
SI/3c	38,2	Sd				
SI/3c	38,8	Sd				
H3f–1	40	Ss	**Mc IV**			
H3f–1	41	Ss	**Context**	**GL**	**Tall**	**Taxon**
SI/3c	41,3	Ss	H3f–1	94,8	96,88	Ss
S I/3c	28,6	Capreolus				
S I/3c	56,7	Cervus	**Mt IV**			
S I/3c	59	Cervus	**Context**	**GL**	**Tall**	**Taxon**
S I/3c	61	Cervus	S I/3c	114,1	100,5	Ss
S I/3c	64,7	Cervus				
Talus						
Context	**GLl**	**GLm**	**Bd**	**Taxon**	**Tall**	
S I/5	71	65	45,5	Bt		
SI/4a	74	68,5	45,5	Bt		
S I/6	75,5	68,5	47,5	Bt		
SI/3c	76	68	48	Bt		
S I/7	76	68	48,5	Bt		
S I/5	76,5	70	46	Bt		
SI/3c	81,1	74,5	51,8	Bp		
SI/3c	83,6	73,6	52	Bp		
S I/3c	51			Ss	93,59	
S I/3c	51,2	45	31,2	Ss	93,95	
S I/3c	52,5	48,5		Ss	96,28	
H3f–2	53,7			Ss	98,42	
S I/3c	58,5	52	35,5	Ss	107,01	
S I/3c	31,3	29,3	19,1	Capreolus		
S I/3c	57,8	53,8	39,1	Cervus		
S I/3c	63,5	58,1	43	Cervus		
Tibia						
Context	**Bp**	**Bd**	**Dd**	**Taxon**		
H3f–1a	114			Bp		
H3f–1a	115			Bp		
SI/3c		70,6	53,1	Bt		
S I/5		75	52	Bp		
SI/3c		74	58	Bp		
SI/3c		77	55,2	Bp		
SI/3c		26,6	19,7	Capra		
SI/3c		23	18,7	Ovis		
H3c–2	42			Sd		
SI/3c	55			Sd		
H3f–1		26,7	23,5	Sd		
H3f–1		27,2	23,2	Sd		
H3f–1a		34,3	29,3	Sd?		

S I/3c		37	34,2	Ss		
S I/3c		37,1	35,1	Ss		
SI/3c		37,3		Ss		
SI/3c		37,3	31,5	Ss		
SI/3c		37,3	31,8	Ss		
H3f–1		37,6	33,7	Ss		
SI/3c		38	33,2	Ss		
SI/3c		38,5	32,2	Ss		
SI/3c		42	37	Ss		
SI/3c		43,6	33,6	Ss		
S I/4			32	Ss?		
S I/5		22,5	17,5	Capreolus		
S I/3c		52,2	39,8	Cervus		
S I/3c		52,4	43,1	Cervus		
S I/3c		57	44,5	Cervus		
S I/3c		59,3	46,3	Cervus		
H3f–2		59,2	46	Cervus		
S I/5		20,5	14,5	Canis f.		
Calcaneus						
Context	**Gl**	**GB**	**Taxon**	**Tall**		
S I/5	130,5	44	Bt			
H3f–1	151,4	48	Bt			
H3f–2	164	50,1	Bp			
S I/3c	92		Ss	88,53		
SI/ 3c	94		Ss	90,4		
SI/ 3c	95,6	29,7	Ss	91,89		
H3f–1	97,8	29,7	Ss	93,94		
H3f–1a	100,5	32	Ss	96,47		
SI/ 3c	104,3	29	Ss	100		
SI/ 3c	111	32	Ss	105,8		
SI/ 3c	111,1	33,2	Ss	106,36		
H3f–1a	67,6	42,2	Capreolus			
S I/3c	38,1	15	Lepus			

Bt- Bos taurus; Bp- Bos primigenius; Ss- Sus scrofa ferrus; Sd- Sus scrofa domesticus.

Abbreviations

AAASH	Acta Archaeologica Academiae Scientarum Hungaricae. Budapest.
Acta Ant et Arch Suppl	Acta Antiqua et Archaeologica Supplementum. Szeged.
AAC	Acta Archaeologica Carpathica. Krakow.
ACMIT	Anuarul Comisiunii monumentelor istorice. Secţia pentru Transilvania. Cluj.
ARA	Annual Review of Anthropology. Stanford.
ActaArchHung	ActaArchHung Acta Archaeologica Academiae Scientiarum Hungaricae. Budapest.
AEM	Archäologische Epigraphische Mitteilungen aus Österreich-Ungarn. Heidelberg.
AIIA Cluj	Anuarul Institutului de Istorie şi Arheologie. Cluj-Napoca.
AISC	Anuarul Institutului de Studii Clasice. Cluj-Napoca.
AMP	Acta Musei Porolissensis. Zalău.
ATF	Acta Terrae Fogarasiensis. Făgăraş.
ATS	Acta Terrae Septemcastrenses. Sibiu.
Agria	Agria. Annales Musei Agriensis. Az egri Dobó István Vármúzeum évkönyve. Eger.
AnB S.N.	Analele Banatului. Timişoara.
AMS.CEU	Annual of Medieval Studies at CEU. Budapest.
ACN	Archaeological Computing Newsletter. Florence.
ArchÉrt	Archaelogiai Értesítő. A Magyar Régészeti és Művészettörténeti Társulat tudományos folyóirata. Budapest.
ArchJug	Archaeologia Iugoslavica. Beograd.
ArhPregled	Arheološki Pregled. Arheološko Društvo Jugoslavije. Beograd.
ArchSlovCat	Archaeologia Slovaca Catalogi. Bratislava.
Archaeológiai Közlemények	Archaeológiai Közlemények. A hazai Műemlékek Ismeretének Előmozdítására. Budapest.
ArchKorr	Archaölogisches Korrespondenzblatt. Mainz.
ArhMold	Arheologia Moldovei. Iași.
AMN	Acta Musei Napocensis. Cluj-Napoca.
AMP	Acta Musei Porolissensis. Zalău.
ArchRozhl	Archeologické Rozhledy. Praga.
ArhMed	Arheologia Medievală. Cluj-Napoca, Brăila, Reșița.
ASMB	Arheologia Satului Medieval din Banat. Reşiţa 1996.
AVSL	Auftrage des Vereins für siebenbürgische Landeskunde, Wien.
Banatica	Banatica. Reşiţa.
BAM	Brvkenthal Acta Mvsei. Sibiu.
BAR Int. Ser.	British Archaeological Reports. International Series. Oxford.
BCMI	Buletinul Comisiunii Monumentelor Istorice. București.
BCȘS	Buletinul Cercurilor Ştiinţifice Studenţeşti. Arheologie – Istorie – Muzeologie. Alba Iulia.
BG	Botanical Guidebooks. Kraków.
BerRGK	Bericht der RömischGermanischen Kommission. Frankfurt a. Main.
BHAB	Bibliotheca Historica et Archaeologica Banatica. Timişoara.
BHAUT	Bibliotheca Historica et Archaeologica Universitatis Timisiensis. Timișoara.
BMB. SH	Biblioteca Muzeului Bistriţa. Seria Historica. Bistriţa Năsăud.
BMÉ	Bihari Múzeum Évkönyve. Berettyóújfalu.
BMI	Buletinul Monumentelor Istorice. Bucureşti.
BMN	Bibliotheca Musei Napocensis. Cluj-Napoca.
BMMK	A Békés Megyei Múzeumok Közleményei. Békéscsaba.
BMMN	Buletinul Muzeului Militar Naţional. Bucureşti.
BThr	Bibliotheca Thracologica. Institutul Român de Tracologie. Bucureşti.

CAB	Cercetări Arheologice în Bucureşti. Bucureşti.
CAH	Communicationes Archaeologicae Hungariae. Budapest.
Carpica	Carpica. Muzeul Judeţean de Istorie și Arheologie, Bacău.
CAMNI	Cercetări Arheologice. Muzeul de Istorie al R. S. România/Muzeul Naţional de Istorie. Bucureşti.
CIL	*Corpus Inscriptionum Latinarum*. Berlin.
CCA	*Cronica cercetărilor arheologice* (*din România*), 1983-1992 *sqq*. (şi în variantă electronică pe *http://www.cimec.ro/scripts/arh/cronica/cercetariarh.asp*).
Classica et Christiana	Classica et Christiana. Iasi.
CRSCRCR	Coins from Roman sites and collections of Roman coins from Romania. Cluj-Napoca.
Crisia	Crisia. Muzeul Țării Crișurilor, Oradea.
Dacia N.S.	Dacia. Revue d'archéologie et d'histoire ancienne. Nouvelle serie. Bucureşti.
Danubius	Danubius - Revista Muzeului de Istorie Galati. Galați.
DDME	A Debreceni Déri Múzeum Évkönyve. Debrecen.
DolgCluj	Dolgozatok az Erdélyi Nemzeti Érem- és Régiségtárából, Klozsvár (Cluj).
DolgSzeg	Dolgozatok. Arbeiten des Archäologischen Instituts der Universität. Szeged.
EphNap	Ephemeris Napocensis. Cluj-Napoca.
EMEÉ	Az Erdélyi Múzeum-Egyesület Évkönyve. Cluj-Napoca.
EMÉ	Erdélyi Múzeum Évkönyve. Cluj-Napoca.
EAZ	Ethnographisch-Archäologische Zeitschrift. Berlin.
FADDP/GMADP	Führer zu archäologischen Denkmälern in Dacia Porolissensis/Ghid al monumentelor arheologice din Dacia Porolissensis. Zalău.
File de Istorie	File de Istorie. Bistrița.
FolArch	Folia Archaeologica. Budapest.
Forsch. u. Ber. z. Vor- u. Frühgesch. BW	Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg.
GPSKV	Gradja za proučavanje spomenika kulture Vojvodine. Novi Sad.
GSAD	Glasnik Srpskog Arheološkog Društva. Beograd.
HOMÉ	A Herman Ottó Múzeum Évkönyve. Miskolc.
HTRTÉ	Hunyadvármegye Történelmi és Régészeti Társulat Évkönyve. Déva (Deva).
JAMÉ	A nyíregyházi Jósa András Múzeum Évkönyve. Nyíregyháza.
JahrbuchRGZM	Jahrbuch des RömischGermanischen Zentralmuseums Mainz.
JAHA	Journal of Ancient History and Archaeology. Cluj-Napoca.
Lohanul	Lohanul. Revistă cultutal științifică. Huși.
MCA	Materiale şi Cercetări Arheologice. Bucureşti.
MCA-S.N.	Materiale şi Cercetări Arheologice-Serie Nouă. Bucureşti.
MA / MemAnt	Memoria Antiqvitatis. Piatra Neamț.
MFMÉ	A Móra Ferenc Múz. Évkönyve. Szeged.
MFMÉ StudArch	A Móra Ferenc Múzeum Évkönyve, Studia Archaelogica. Szeged.
MN / MuzNat	Muzeul Naţional. Bucureşti.
NumAntCl	Numismatica e antichitàclassiche. Milano.
Opitz Archaeologica	Opitz Archaeologica. Budapest.
Opuscula Hungarica	Opuscula Hungarica. Budapest.
OM	Orbis Mediaevalis. Arad, Cluj-Napoca.
OTÉ	Orvos- Természettudományi Értesitő, a Kolozsvári Orvos-Természettudományi Társulat és az Erdélyi Múzeum-Egylet Természettudományi Szakosztálya.
Palaeohistorica	Acta et Communicationes Instituti Archaeologici Universitatis Groninganae.
PamArch	Památky Archeologické. Praha.
Past *and* Present	Past *and* Present. Oxford.
PIKS/PISC	Die Publikationen des Institutes für klassische Studien/ Publicaţiile Institutului de studii clasice. Cluj-Napoca.
PBF	Praehistorische Bronzefunde. Berlin.
PMÉ	Acta Musei Papensis – Pápai Múzeumi Értesítő.
PZ	Prähistorische Zeitschrift. Berlin.

ReDIVA	Revista Doctoranzilor în Istorie Veche și Arheologie. Cluj-Napoca.
Revista Bistriței	Revista Bistriței. Bistrița.
RevMuz	Revista Muzeelor. București.
RIR	Revista Istorică Română.
RMM-MIA	Revista Muzeelor şi Monumentelor. Seria Monumente istorice şi de artă. Bucureşti.
RMMN	Revista Muzeului Militar Naţional. Bucureşti.
RESEE	Revue des Études Sud-Est Européennes. București.
Ruralia	Ruralia. Památky Archeologické – Supplementum. Praha.
RVM	Rad Vojvodjanskih Muzeja. Novi Sad.
Sargetia	Sargeția. Muzeul Civilizației Dacice și Romane, Deva.
Savaria	Savaria. A Vas megyei Múzeumok Értesítője. Szombathely.
SCIV(A)	Studii şi Cercetări de Istorie Veche. Bucureşti.
SCN	Studii şi Cercetări Numismatice. Bucureşti.
SlovArch	Slovenská Archeológia. Nitra.
SIA	Studii de Istoria Artei. Cluj Napoca.
SIB	Studii de istorie a Banatului. Timişoara.
SKMÉ	A Szántó Kovács János Múzeum Évkönyve. Orosháza.
SMIM	Studii şi Materiale de Istorie Medie. Bucureşti.
SMMA	Szolnok Megyei Múzeumi Adattár. Szolnok.
SMMIM	Studii şi Materiale de Muzeografie şi Istorie Militară. Bucureşti.
Starinar	Starinar. Arheološki Institut. Beograd.
Stratum plus	Stratum plus. Archaeology and Cultural Anthropology. Kishinev.
StCl	Studii Clasice. București.
StComBrukenthal	Studii şi comunicări. Sibiu.
StudArch	Studia Archaeologica. Budapest.
StudCom	Studia Comitatensia. Szentendre.
Studii și Comunicări	Studii și Comunicări. Arad.
StudUnivCib	Studia Universitatis Cibiniensis. Sibiu.
StudCom – Vrancea	Studii și Comunicări. Muzeul Județean de Istorie și Etnografie Vrancea. Focșani.
StudŽvest	Študijne Zvesti Arheologického Ústavu Slovenskej Akademie Vied. Nitra.
Symp. Thrac.	Symposia Thracologica. București.
Századok	Századok. A Magyar Történelmi Társulat Folyóirata. Budapest.
TIR L34	D. Tudor, *Tabula Imperii Romani*. București 1965.
Tempora Obscura	Tempora Obscura. Békéscsaba 2012.
Tibiscus	Tibiscus. Timişoara.
VAH	Varia Archaeologica Hungarica. Budapest.
VIA	Visnik Institutu arkheolohii. L'viv.
Ziridava	Ziridava. Arad.
ZSA	Ziridava Studia Archaeologica. Arad.
w.a.	without author