

Faunal material from two Hallstatt Period settlements in Slovenia

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Izveček

V članku so arheozoološko obdelani najdeni okostni ostanki iz dveh halštatskih naselbin v Sloveniji (SZ Jugoslavija): Kunkel pod Vrhtrebnjem in Vesela gora v Brinju. Pripadajo skoraj izključno domačim živalim. Gradivo se primerja z večjo istodobno zbirko z Mosta na Soči in ugotavlja, da med njima ni večjih razlik. Poseben poudarek je na analizi velikosti fragmentov z uporabo statističnih metod.

Abstract

The paper presents an archaeozoological examination of bone remains from Kunkel below Vrhtrebnje and Vesela gora in Brinje, two Hallstatt settlements in Slovenia (NW Yugoslavia). The remains belong almost exclusively to domestic animals. Comparing the material with a bigger contemporaneous assemblage from Most na Soči, the author finds no essential differences between the two sets. He focuses particularly on the fragment size analysis, applying statistical methods.

INTRODUCTION

Test excavations, directed by dr. Janez Dular (Inštitut za arheologijo ZRC SAZU, Ljubljana) in collaboration with prof. Drago Svoljšak (Narodni muzej, Ljubljana) and prof. Borut Križ (Zavod za varstvo naravne in kulturne dediščine, Novo mesto) at a number of fortified prehistorical sites in Dolenjska region (*cf.* J. Dular *et al.*, *Arch. vest.* 42, 1991) resulted in the recovery of animal bone assemblages of various sizes. Two such settlement materials from Kunkel (Vrhtrebnje) and Vesela gora (Brinje), are discussed in this paper. The excavation at Vesela gora brought to light some Medieval material as well which will not be analyzed at length here but is of interest in the taphonomic evaluation of the material.

MATERIAL AND METHOD

The faunal composition of the two sites as well as that of Most na Soči, a major Hallstatt settlement analyzed previously (Bartosiewicz 1985, 108), are shown in *Tab. 1*. Considering the relatively small number of bones recovered by test excavations, only the number of identifiable specimens (NISP) is listed in this table in terms of frequencies and percentages.

In addition to English vernacular and latin species names, three terms in this faunal list need to be explained. Sheep/goat remains were referred to as Caprine bones, in cases when identification was not possible below the subfamily level. Bones which do not lend themselves to precise identification were listed as remains of "Large" and "Small" mammals as defined previously (Bartosiewicz 1985, 108, footnote 1). These categories are extended to the identifiable bone material as well in the subsequent quantitative

analysis: fragmentation was studied in terms of the univariate statistics of fragment sizes and related Student t-tests (Williams 1979, 72).

RESULTS

1. Faunal characteristics

In spite of their small sizes, test excavation assemblages from the Hallstatt component of Kunkel and Vesela gora show remarkable similarity to the relative representation of domestic animal species at Most na Soči (*Tab. 1*). At this latter site, the presence of horse bones is the only remarkable difference, however, the small contribution of this species to a larger assemblage is not surprising in terms of statistical probabilities (Grayson 1984, 138). Oscillations in the percentual contributions by horse and dog are additionally explained by the non-meat type of exploitation of these animals during the period concerned. The faunal compositions of these two small Hallstatt Period assemblages from the two sites examined here, thus, fall in line with previous large scale observations at Most na Soči.

The small Medieval material does not contain substantial faunal information in itself. It is indicative of meat consumption based on domesticates, especially cattle and Caprines.

2. Fragmentation

Taphonomy, a concept introduced by the paleontologist Efremov (1940, 82) refers to the *post mortem* effects that influence our perception of the faunal material. Of these, fragmentation is of primary interest here, since Iron Age bone assemblages from Slovenia are often remarkably poorly preserved and contain a relatively high percentage of non-identifiable speci-

Table 1: Faunal lists of the studied settlements in comparison with the large Hallstatt Period assemblage from Most na Soči
 Tab. 1: Seznam favne z obravnavanih najdišč v primerjavi z večjim halštatskodobnim vzorcem z Mosta na Soči

Taxa	Kunkel		Vesela gora				Most na Soči	
	NISP	%	Hallstatt halstat. NISP	%	Medieval srednjev. NISP	%	NISP	%
Cattle (<i>Bos taurus</i> L. 1758) govedo	128	45.4	37	47.4	40	61.5	1246	42.2
Sheep (<i>Ovis aries</i> L. 1758) ovca	14	5.0	5	6.4	3	4.6	479	16.2
Goat (<i>Capra hircus</i> L. 1758) koza	1	0.4	–	–	2	3.1	44	1.5
Sheep/goat (<i>Caprinae</i> Gray) ovca/koza	99	35.1	23	29.5	18	27.7	889	30.1
Pig (<i>Sus domesticus</i> Erxl. 1777) svinja	26	9.2	8	10.3	1	1.5	236	8.0
Horse (<i>Equus caballus</i> L. 1758) konj	–	–	–	–	–	–	10	0.3
Red deer (<i>Cervus elaphus</i> L. 1758) jelen	–	–	2	2.6	–	–	30	1.0
Roe deer (<i>Capreolus capreolus</i> L. 1758) srna	1	0.4	1	1.3	–	–	3	0.1
Wild pig (<i>Sus scrofa</i> L. 1758) divja svinja	–	–	2	2.6	–	–	14	0.5
Dog (<i>Canis familiaris</i> L. 1758) pes	13	4.6	–	–	1	1.5	5	0.2
Total identifiable Skupaj opredeljivih	282		78		65		2956	
Large mammal Veliki sesalci	66		29		4		1462	
Small mammal Mali sesalci	35		15		–		735	
Settlement total Naselbina skupaj	383		122		69		5153	

NISP = število določljivih ostankov

Table 2: Bone measurements after von den Driesch (1976)

Tab. 2: Mere kosti, po von den Drieschevi (1976)

		Kunkel						
Species, vrsta	Bone, kost	G1	Bp	Dp	SB	SD	Bd	Db
sheep, ovca	radius	–	–	–	–	–	26.1	17.2
sheep, ovca	radius	–	–	–	15.1	7.9	25.9	17.9
sheep, ovca	radius	–	24.2	14.1	–	–	–	–
sheep, ovca	radius	–	28.5	15.8	–	–	–	–
sheep, ovca	radius	–	29.5	14.1	–	–	–	–
sheep, ovca	astragalus	26.2	25.9*	–	–	–	17.2	15.6
sheep, ovca	astragalus	28.9	26.6*	–	–	–	17.6	15.9
pig, svinja	tibia	–	–	–	–	–	29.8	26.9
dog, pes	scapula	–	–	–	–	–	17.9	28.1
dog, pes	tibia	145.0	29.1	28.9	10.3	–	18.2	13.5
roe deer, srna	metacarpus	–	22.0	15.2	–	–	–	–
		Vesela Gora (Hallstatt, halštatske)						
Species, vrsta,	Bone, kost	G1	Bp	Dp	SB	SD	Bd	Dd
cattle, govedo	lower, spodnji M3	35.0	14.5**	–	–	–	–	–
red deer, jelen	metatarsus	–	42.9	41.8	–	–	–	–
		Vesela Gora (Medieval, srednjeveške)						
Species, vrsta	Bone, kost	G1	Bp	Dp	SB	SD	Bd	Dd
cattle, govedo	lower, spodnji M3	34.1	13.3**	–	–	–	50.9	75.0
cattle, govedo	scapula	–	–	–	–	–	–	–
cattle, govedo	metacarpus	–	51.9	32.8	–	–	–	–
cattle, govedo	metatarsus	–	–	–	–	–	45.4	25.5
cattle, govedo	metatarsus	–	–	–	–	–	54.7	30.5
cattle, govedo	metatarsus	–	51.2	47.1	–	–	–	–
sheep, ovca	humerus	–	–	–	–	–	27.7	24.5
sheep, ovca	radius	–	–	–	–	–	30.5	16.5

Note: * = in the case of astragalus this measurement is medial length.

** = in the case of the lower third molar this measurement is the greatest breadth of tooth.

Opomba: * = v primeru astragala gre za srednjo dolžino.

** = v primeru spodnjega tretjega molarja gre za največjo širino zoba.

mens. The number of measurable bones (*Tab. 2*) is similarly small (Bartosiewicz 1985, 109).

There is a clear logical relationship between identifiability and fragmentation: better preserved bones are easier to recognize. This is well illustrated by the relatively small mean fragment lengths of nonidentifiable bones in *Tables 3* to *5* (mean lengths of these bone fragments from both "Large" and "Small" mammals are less than 4 cm). A water-sieving experiment also showed that using only hand collection (as was the case with the assemblages studied here) fragments smaller than 1.9 cm are likely to be lost with a 95% probability (Bartosiewicz 1988, 269). Experience shows, however, that in the case of macromammalian remains (such as bones of domesticates), even somewhat larger pieces, safely recovered by meticulous hand collection, are difficult to recognize.

Although natural agents, such as oscillations in temperature and soil pressure as well as unintentional trampling undoubtedly contribute to fragmentation, small bone splinters are frequently encountered in themselves without matching pieces within the same feature. In the preliminary study devoted to Most na Soči it was implicitly hypothesized that this intensive fragmentation may be culturally determined, (Bartosiewicz 1985, 116) that is, butchering and culinary tradition acts as a major taphonomic factor in produ-

cing the great number of small and, thus, nonidentifiable fragments. Larger bones may be smashed during secondary butchering to produce more easily manageable cuts for the household pot. Marrow extraction may result in similarly small fragments (Binford 1978, 153).

This hypothesis was tested using bone materials from Kunkel and Vesela gora. During the identification process each bone fragment from these sites was classified into size groups with 1 cm intervals.

Hallstatt Period materials from the two settlements were compared to each other and to the later (Medieval) component of Vesela gora, which was deposited under comparable soil conditions.

As may be seen from the statistical parameters, with only one exception, significant ($P \leq 0.05$) differences occur only between the remains of large vs. small mammals (*Tab. 6* and *7*) although the actual differences in these cases are far smaller than could be expected on the basis on the live weight or complete bone dimensions of these animals. This is another very obvious illustration of earlier observations by Binford and Bertram (1977, 98).

The only significant difference within the same size category was found between the small mammalian remains from Kunkel and the Medieval component of Vesela gora. Measures of dispersion listed in *Table 6*

Table 3: The distribution of species and skeletal parts from Kunkel

Tab. 3: Zastopnost vrst in skeletnih delov v Kunklu

	Cattle Govedo	Sheep Ovca	Goat Koza	Caprine deer Drobnica	Pig Svinja	Roe deer Srna	Dog Pes	Large mammal Veliki sesalci	Small mammal Mali sesalci
Horn core, rožnica	1	-	1	-	-	-	-	-	-
Frontale	2	-	-	-	2	-	-	-	-
Neurocranium	3	-	-	3	-	-	3	-	3
Zygomatic	-	-	-	1	-	-	1	-	-
Maxilla	1	-	-	-	1	-	2	-	-
Mandibula	19	-	-	8	1	-	1	-	1
Tooth, zob	37	-	-	19	11	-	-	-	-
Vertebrae									
cervical, vratna	-	-	-	-	-	-	-	-	1
thoracic, prsna	-	-	-	-	1	-	-	-	-
lumbar, ledvena	-	-	-	3	-	-	-	-	-
sacral, križna	1	-	-	1	-	-	-	-	-
Ribs, rebra	2	-	-	12	1	-	2	8	15
Scapula	5	-	-	4	1	-	1	2	-
Humerus	7	1	-	8	1	-	-	-	-
Radius	7	-	-	7	1	-	1	-	-
Ulna	3	-	-	-	-	-	-	-	-
Metacarpus	4	3	-	4	1	1	-	-	-
Phalanx proximalis	1	-	-	2	-	-	-	-	-
Ilium	1	-	-	3	-	-	-	-	-
Acetabulum	6	-	-	3	-	-	-	-	-
Femur	6	1	-	7	1	-	-	-	-
Tibia	12	-	-	12	3	-	1	1	-
Astragalus	1	2	-	-	-	-	-	-	-
Calcaneus	-	-	-	-	1	-	-	-	-
Metatarsus	8	1	-	1	-	-	1	-	-
Long bone, dolga kost	-	-	-	2	-	-	-	37	9
Flat bone, kratka kost	1	-	-	-	-	-	-	18	6
Number, število	128	14	1	99	26	1	13	66	35
Mean length (cm)	5.8	5.9	3	4.4	4.2	8.0	5.3	3.9	3.1
Srednja dolžina									

Note: The material also included a red deer antler fragment and remains of a hamster skeleton.

Opomba: V gradivu so bili tudi fragment jelenovega rogovja in ostanki hrčkovega skeleta.

Table 4: The distribution of species and skeletal parts from Vesela gora (Hallstatt)
 Tab. 4: Zastopanost vrst in skeletnih delov na Veseli gori (halštatskodobni ostanki)

	Cattle Govedo	Sheep Ovca	Goat Koza	Caprine deer Drobnica	Pig Svinja	Red deer Jelen	Roe Srna	Large mammal Veliki sesalci	Small mammal Mali sesalci
<i>Frontale</i>	2	-	-	-	-	-	-	-	-
<i>Neurocranium</i>	-	-	-	-	-	1	-	-	-
<i>Maxilla</i>	-	-	-	-	1	-	-	-	-
<i>Mandibula</i>	8	-	-	1	2	-	-	-	-
<i>Ramus mandibulae</i>	4	-	-	-	-	-	-	-	-
Tooth, zob	2	-	-	2	2	-	-	-	-
<i>Vertebrae</i>									
thoracic, prsna	-	-	-	-	-	-	-	-	1
lumbar, ledvena	1	-	-	-	-	-	-	-	-
Ribs, rebra	3	-	-	-	-	-	-	2	4
<i>Scapula</i>	4	-	-	1	1	-	-	2	-
<i>Humerus</i>	4	-	-	-	-	-	-	-	-
<i>Radius</i>	-	-	-	2	-	-	-	-	-
<i>Metacarpus</i>	2	1	-	-	-	-	-	-	-
<i>Phalanx proximalis</i>	-	-	-	1	1	-	-	-	-
<i>Acetabulum</i>	3	-	-	-	2	-	-	-	-
<i>Femur</i>	1	1	-	1	-	-	-	-	-
<i>Tibia</i>	1	-	-	9	1	-	-	-	1
<i>Astragalus</i>	1	1	-	-	-	-	-	-	-
<i>Metatarsus</i>	1	2	-	-	-	1	1	-	-
Long bone, dolga kost	-	-	-	6	-	-	-	13	8
Flat bone, ploščata kost	-	-	-	-	-	-	-	10	-
Number, število	37	5	-	23	10	2	1	29	15
Mean length (cm)	5.4	5.4	-	4.2	5.9	7.0	5.0	3.8	3.7
Srednja dolžina									

Note: The pig femur splinter and one of the tibia fragments may originate from wild individuals.

Opomba: Odlomek femurja svinje in eden od fragmentov tibije morda pripadata divjim primerkom.

Table 5: The distribution of species and skeletal parts from Vesela gora (Medieval)

Tab. 5: Zastopanost vrst in skeletnih delov na Veseli gori (srednjeveški ostanki)

	Cattle Govedo	Sheep Ovca	Goat Koza	Caprine Drobnica	Pig Svinja	Dog Pes	Large mammal Veliki sesalci
Horn core, rožnica	-	-	2	-	-	-	-
<i>Neurocranium</i>	2	-	-	-	-	-	-
Zygomatic	1	-	-	-	-	-	-
<i>Maxilla</i>	-	-	-	-	1	1	-
<i>Mandibula</i>	2	-	-	1	-	-	-
Tooth, zob	3	1	-	1	-	-	-
<i>Vertebrae</i>							
axis, nedol.	1	-	-	-	-	-	-
cervical, vratna	1	-	-	-	-	-	-
Ribs, rebra	2	-	-	-	-	-	1
<i>Scapula</i>	2	-	-	-	-	-	-
<i>Humerus</i>	1	1	-	1	-	-	-
<i>Metacarpus</i>	1	1	-	-	-	-	-
<i>Phalanx</i>							
<i>proximalis</i>	6	-	-	-	-	-	-
<i>media</i>	5	-	-	-	-	-	-
<i>Ilium</i>	1	-	-	-	-	-	-
<i>Acetabulum</i>	1	-	-	-	-	-	-
<i>Femur</i>	2	-	-	1	-	-	-
<i>Tibia</i>	4	-	-	6	-	-	-
<i>Astragalus</i>	1	-	-	-	-	-	-
<i>Metatarsus</i>	4	-	-	-	-	-	1
Long bone, dolga kost	-	-	-	8	-	-	-
Flat bone, kratka kost	-	-	-	-	-	-	2
Number, število	40	3	2	18	1	1	4
Mean length (cm)	6.4	6	6	5.2	5	3	3.7
Srednja dolžina							

Note: A human ulna was also found in this bone material.

Opomba: Med tem kostnim gradivom je bila najdena tudi človeška ulna.

Table 6: Univariate statistics of fragment lengths (in cm) by two animal size categories from two periods of two sites
 Tab. 6: Statistike dolžin fragmentov (v cm) po dveh živalskih velikostnih skupinah, iz dveh obdobjih dveh najdišč

Site Najdišče	Period Obdobje	Size category Velikostna skupina	n	Mean value Srednja vrednost	Standard deviation Standardna deviacija	Standard error of mean Povprečna standardna napaka
Kunkel	Hallstatt halštat	large, veliki	194	5.008	1.681	0.145
		small, mali	198	4.359	1.649	0.136
Vesela gora	Hallstatt halštat	large, veliki	68	5.368	1.965	0.319
		small, mali	54	4.451	1.912	0.343
	Medieval srednji vek	large, veliki	44	5.676	1.765	0.290
		small, mali	25	5.294	1.961	0.475

Table 7: Pooled t-values and the significance of differences between fragment lengths in the discussed groups
 Tab. 7: Vrednosti t-preizkusa in značilnosti razlik med dolžinama fragmentov v obravnavanih skupinah

Site Najdišče	Period Obdobje	Size category Velikostna skupina	Kunkel		Vesela gora		Medieval srednjeveški	
			small mali	large veliki	small mali	large veliki	small mali	
Kunkel	Hallstatt halštat	large, veliki	3.76***	-0.87	1.85	-1.86	-0.47	
		small, mali		-3.25***	-0.28	-4.28***	-2.17*	
Vesela gora	Hallstatt halštat	large, veliki			1.95*	-0.71	0.13	
		small, mali			-2.74*	-1.45		
	Medieval Srednji vek	large veliki					0.71	

Levels of significance: *: $P \leq 0.05$, ***: $P \leq 0.005$
 Stopnji značilnosti: *: $P \leq 0.05$, ***: $P \leq 0.005$

show that fragmentation at Kunkel was most homogeneous. Although mean values for the Hallstatt material from Vesela gora were similarly small, the standard deviations and coefficients of variation for these fragments were higher. Consequently, systematically larger Medieval fragments showed more of a size overlap with Hallstatt material from the same site, while small mammalian remains from Kunkel could be distinguished as separate.

CONCLUSIONS

Faunal characteristics of the Hallstatt Period settlements of Kunkel and Vesela gora show remarkable similarity to the large and, thus, more reliable archaeozoological sample from Most na Soči. An overwhelming dominance of domestic animal remains may be observed, with major roles played by cattle and Caprines as meat suppliers. The importance of hunting was negligible. However, red deer antler was a relatively important raw material in Iron Age Central Europe (Kossack 1959, 69) and was represented in the large

assemblage from Most na Soči as well (Bartosiewicz 1985, 109). Only one piece was identified from Kunkel, which could very well be a fragment of shed antler.

This type of Iron Age animal keeping has been described by several authors in the area concerned as summarized by Bökönyi (1974, 73). It appears that a wide range of domestic plants and animals were exploited by Hallstatt populations in Central Europe. Jahnkuhn (1969, 76) emphasizes the importance of cattle, pig, sheep and goat.

The fragmentation study in this paper indicated, however, that the numerical dominance of cattle bone splinters in the bone assemblage should be treated cautiously. The higher intensity natural and artificial fragmentation of larger animal bones may lead to the overrepresentation of large Ungulates in terms of NISP. Although this is in practice compensated by significantly larger meat outputs by these large animals, the exact relationship between size related preservation and actual differences in meat yield cannot be quantified.

The higher degree of fragmentation in Hallstatt materials could be partially demonstrated in numerical terms.

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Živalski ostanki iz dveh halštatskodobnih naselbin v Sloveniji

Prevod

UVOD

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GRADIVO IN METODA

Zastopanost favne na obeh najdiščih, pa tudi na Mostu na Soči, večji halštatski naselbini, ki je že bila analizirana (Bartosiewicz 1985, 108), je prikazana na tabeli 1. Glede na sorazmerno majhno število kosti, najdenih pri poskusnih izkopavanjih, so na tabeli navedeni samo primerki, ki jih je bilo mogoče določiti (NISP – *number of identifiable specimens*), njihovo število in procenti.

Poleg angleških in latinskih imen za vrste je treba razložiti tri imena na tem seznamu favne. Ostanke ovce/koze so označeni kot *Caprinae* v primerih, ko ni bila mogoča identifikacija pod nivojem poddružine. Kosti, ki jih ni bilo mogoče natančno opredeliti, so navedene kot ostanke »velikih« in »malih« sesalcev, definiranih na drugem mestu (Bartosiewicz 1985, 108, op. 1). Te kategorije so bile razširjene tudi na opredeljeni kostni material v kasnejši kvantitativni analizi: fragmentarnost je bila preučena na osnovi statistik velikosti fragmentov in ustreznih t-preizkusov (Williams 1979, 72).

REZULTATI

1. Značilnosti favne

Kljub majhnemu obsegu so zbirke, najdene med poskusnimi izkopavanji v halštatskih plasteh Kunkla in Vesele gore, presenetljivo podobne tistim z Mosta na Soči, kar zadeva zastopanost domačih živalskih vrst (tab. 1). Edino pomembno

razliko predstavlja prisotnost kosti konja na Mostu na Soči, vendar majhen delež te vrste v večjem vzorcu ne preseneča, upoštevajoč statistično verjetnost (Grayson 1984, 138). Oscilacije v procentualni zastopanosti konja in psa si je mogoče razlagati tudi z nemesnim izkoriščanjem teh živali. Zastopanost favne v teh majhnih halštatskodobnih zbirkah z dveh obravnanih najdišč je torej v skladu s prejšnjimi opažanji v večjem obsegu na Mostu na Soči.

Majhna količina srednjeveškega gradiva sama na sebi ne vsebuje bistvenih podatkov o favni, izpričuje pa uživanje mesa domačih živali, predvsem goveda in drobnice.

2. Fragmentarnost

Tafonomija, koncept, ki ga je uvedel paleontolog Efremov (1940, 82), zadeva dejavnike, ki učinkujejo *post mortem* in ki vplivajo na naše zaznavanje živalskega gradiva. Med temi nas na tem mestu najbolj zanima fragmentarnost, saj so zbirke železnodobnih kostnih ostankov iz Slovenije čisto izredno slabo ohranjene in vsebujejo sorazmerno visok procent neopredeljivih primerkov, število merljivih kosti (tab. 2) pa je majhno (Bartosiewicz 1985, 109).

Med določljivostjo na taksonomski ravni in fragmentarnostjo je jasna logična zveza: bolj ohranjene kosti je lažje prepoznati. Dobro ilustracijo predstavljajo sorazmerno majhne srednje dolžine fragmentov neopredeljivih kosti na tabelah 3 do 5 (srednje dolžine teh kostnih fragmentov, pripadajočih tako »velikim« kot »malim« sesalcem, so manj kot 4 cm). Eksperiment z izpiranjem je tudi pokazal, da se ob izključno ročnem nabiranju (kar velja za tukaj preučevane zbirke) fragmenti, manjši od 1,9 cm, izgubijo s 95 % verjetnostjo (Bartosiewicz 1988, 269). Izkušnja pa kaže, da je v primeru ostankov velikih sesalcev (npr. kosti domačih živali) težko prepoznati celo nekoliko večje kose, ki jih z natančnim ročnim nabiranjem zanesljivo najdemo.

Čeprav naravni dejavniki, tako kot nihanja v temperaturi in pritiski zemlje, pa tudi nenamerno tacanje, nedvomno prispevajo k fragmentarnosti, se majhni kostni odlomki pogosto najdejo sami, brez ustreznih kosov znotraj iste enote. V preliminarni študiji Mosta na Soči je bila implicitno postavljena hipoteza, da je ta močna fragmentarnost nemara kulturno pogojena (Bartosiewicz 1985, 116), da so namreč razkosavanje in postopki, vezani na kulinarčno tradicijo, bili glavni tafonomski faktor pri nastajanju velikega števila majhnih in zaradi tega neopredeljivih fragmentov. Večje kosti so morda bile zdrobljene med sekundarnim razkosavanjem, ko je bilo potrebno pripraviti prikladnejše kose za kuhinjski lonec. Prido-

bivanje mozga ima lahko za posledico nastanek podobno majhnih fragmentov (Binford 1978, 153).

Ta hipoteza je bila preverjena na gradivu iz Kunkla in z Vesele gore. V procesu identifikacije je bil vsak kostni fragment s teh najdišč razporejen v velikostne skupine z intervali 1 cm.

Halštatskodobno gradivo iz ene in druge naselbine smo primerjali med seboj, pa tudi s kasnejšim (srednjeveškim) gradivom z Vesele gore, ki je nastalo v podobnih razmerah.

Kot je mogoče videti iz statističnih parametrov, značilne razlike ($P \leq 0,05$), z eno samo izjemo, nastopajo samo med ostanki velikih in malih sesalcev (tab. 6 in 7), čeprav so dejanske razlike v teh primerih veliko manjše, kot bi bilo mogoče pričakovati na osnovi žive teže ali dimenzij celih kosti teh živali. To je še ena zelo očitna ilustracija prejšnjih opažanj Binforda in Bertrama (1977, 98).

Edina značilna razlika znotraj iste velikostne kategorije je bila najdena med ostanki malih sesalcev iz Kunkla in srednjeveško komponento z Vesele gore. Mere variabilnosti, navedene v tabeli 6, kažejo, da je bila fragmentarnost v Kunklu izredno homogena. Čeprav so bile srednje vrednosti za halštatsko gradivo z Vesele gore podobno majhne, so bile vrednosti standardnih deviacij in koeficientov variacije za te fragmente večje. Zaradi tega so sistematično večji srednjeveški fragmenti pokazali večjo prekrivanje v velikosti s halštatskim gradivom z istega najdišča, medtem ko je bilo mogoče ostanke malih sesalcev iz Kunkla razlikovati kot posebno skupino.

ZAKLJUČKI

Značilnosti favne iz halštatskodobnih naselbin Kunkel in Vesela gora kažejo izredno podobnost z večjim in zato bolj

zanesljivim arheozoološkim vzorcem z Mosta na Soči. Opaziti je izredno prevlado ostankov domačih živali, med katerimi izstopajo govedo in drobnica kot glavni viri mesa. Pomen lova je bil zanemarljiv. Vendar so bili jelenji rogovi sorazmerno pomembna surovina v železnodobni Srednji Evropi (Kossack 1959, 69) in so zastopani tudi v veliki zbirki z Mosta na Soči (Bartosiewicz 1985, 109). V gradivu iz Kunkla je bil identificiran samo en kos, ki bi prav lahko bil fragment odpadlega rogovja.

Takšno obliko železnodobnega gojenja živali na zadevnem področju je opisalo več avtorjev, povzel pa Bökönyi (1974, 73). Kaže, da je halštatsko prebivalstvo Srednje Evrope izkoriščalo veliko število domačih rastlin in živali. Jankuhn (1969, 76) poudarja pomen goveda, svinje, ovce in koze.

Preučevanje fragmentarnosti v tem članku pa je pokazalo, da moramo numerično prevlado odlomkov kosti goveda jemati z rezervo. Intenzivnejša naravna in umetna fragmentacija kosti večjih živali lahko vodi v preveč številno zastopanost velikih kopitarjev na osnovi NISP. Čeprav se to v praksi izravnava z občutno večjo količino mesa, ki ga dajejo te velike živali, ni mogoče kvantificirati točnega razmerja med ohranjenostjo, pogojeno z velikostjo, in dejanskimi razlikami v količini razpoložljivega mesa.

Večjo stopnjo fragmentarnosti v halštatskem gradivu je bilo mogoče deloma numerično dokazati.

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