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**ARCHAEOZOOLOGICAL STUDY OF FAUNA REMAINS AT THE
POIANA SETTLEMENT (THE VIIIth-IXth CENTURIES)**

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The archaeozoologic sample we are analysing comes from the Poiana settlement where complexes entirely and exclusively of the VIIIth-IXth centuries were found. The archaeological site lies in the Poiana village, in the Zvorâșteea commune, in the district of Suceava, at about 20 km N-NW of the city of Suceava and at about 5 km west of the Siret river. The fauna remains were gathered and dated under the coordination of the archaeologist Mugur Andronic, to whom we are grateful.

The archaeological diggings at Poiana took place in three archaeological campaigns in the years 1998, 2000 and 2001. We have already published (STANC, BEJENARU, 2001; STANC *et al.*, 2002) a partial archaeozoological analyses of the samples gathered during the diggings in the first two campaigns, some data concerning the ages of the animals when they were killed and some osteometrical data. In this paper we present the cumulated data which we obtained from the fauna remains gathered during all three archaeological campaigns. A number of 1523 bone remains, which are household remains were studied. These were in an advanced fragmentary state, which was due to some extent to precarious conditions of preservation in the sediment, but also to the fact that the bones had been broken in order to get the marrow out for food. The archaeozoological sample consists of bones, teeth, horns of vertebrate animals and mollusc shells. Out of the total of 1523 bone remains only 589 could be allowed specific determination. The determinated fragments could be considered as belonging to three systematic groups: Mollusca, Aves and Mammalia, the last one being better represented in the sample (fig. 1). Two species of molluscs were identified: *Helix pomatia* (47 whole and fragment shells) and *Unio sp.* (3 fragments of valve).

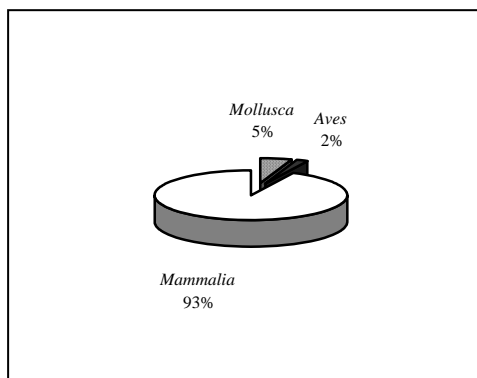


Fig. 1. The frequency of animal systematic groups determined in the sample at Poiana.

Animal resources used in food economy

Breeding animals was one of the main occupations of the inhabitants at Poiana. The percentage of domestic animal remains was 87,2% of the entire fauna remains identified, that is 798 mammal remains and 17 fowl remains. The list of the domestic species identified comprises mammals (*Bos taurus*, *Ovis aries*, *Capra hircus*, *Equus caballus*, *Sus domesticus* and *Canis familiaris*), as well as fowls (*Gallus domesticus* and *Anser domesticus*). An estimation of the predominance of these species expressed in the number of the remains as well as in the number of individuals estimated is shown in table 1. Of the species of domestic mammals predominated the cattle, they representing 50% of the total determined remains. Then came the pigs (30%) and the *Ovis/Capra* both as the number of bone remains and as the minimal estimated number of individuals (table 1). Of the 17 bone remains considered as coming from fowls, six bone remains were identified as hen bones and two as goose bones. We suppose that the other nine bone remains belong to the same two species.

Bos taurus. Of the 418 fragments attributed to cattle the greatest part are bones of the appendicular skeleton (227) the rest are : 73 bones of the skull, 59 detached teeth and 9 vertebrae. We estimated that these fragments came from a minimum number of 17 individual animals (table 1).

Sus domesticus. The dominant number of fragments are bones of the appendicular skeleton (103). Other fragments found of this species are: 83 fragments of the skulls, 7 vertebrae and 50 detached teeth. We

estimated that the identified remained bones came from 16 individual animals, most of them very young. The estimation of the minimum number of individual animals was made taking into account the fragments of the maxilla and mandible bones having teeth on them.

Ovis aries and *Capra hircus*. We found that 93 bone remains belonged to these species, but specific distinction was made only for two of them, a whole and a fragment of goat horn. The 91 fragments considered as coming from these species are follows: 56 bones of the appendicular skeleton, 8 fragments of the skulls, 5 vertebrae and 22 detached teeth. We couldn't estimate the height at withers of these species as complete metapodials were not found.

Equus caballus. For this species we identified: 4 detached teeth, 1 vertebra and 21 bones of the appendicular skeleton. The 26 fragments were considered to come from three individual animals.

Canis familiaris. On the evidence of the 18 fragments found of this species we estimated a minimum number of three individual animals, an immature one (six fragments of skull bones, of which a mandible with deciduous teeth) and 2 mature animals (four bones of appendicular skeleton, two detached molars, four bones of the skull).

In many cases the bones of the domestic mammals constituted raw material for manufacturing various objects, especially awls used to punch the hides of animals and skates. We identified five skates (one from ox metacarpus, two from ox radius and two from horse metatarsus), 11 awls (three from ulna bones, a margin of scapula and a fragment of tibia of *Bos taurus*; metacarpus, metatarsus, tibia of *Ovis/Capra*; ribs and fragment of length bones from great or medium size mammals) and two *Bos/Equus* ribs used as polishers (ANDRONIC, 2001) in dressing and processing the hides. Amulets were also made out of bones (*Ibidem*).

Hunting. The bone remains identified as belonging to wild mammals (8%) came from the following six species: *Cervus elaphus*, *Sus scrofa*, *Capreolus capreolus*, *Ursus arctos*, *Canis vulpes*, *Castor fiber*.

Cervus elaphus. Of the wild mammals species, the stag is the best represented in the number of bone remains. The 37 bone remains are considered to come from at least four individuals, all of them mature animals. The bone fragments come from all parts of the skeleton. At least one of the red antlers seems to have been sloughed and gathered from the woods as material for useful purposes. Five parts of red antlers present evidence of having been worked upon. They seem to be scraps rejected in the process of manufacturing different objects. Two of them are

chippings and three are cut with a saw. The dimensions found as a result of the measurements we took are recorded in table 5.

Sus scrofa. The number of bone and teeth remains is quite small, only twenty. For this species we identified 12 teeth and two fragments of skull; the other fragments representing bones of the appendicular skeleton. Considering nine lower and one upper eye-teeth we estimated a minimum number of nine individual animals.

Table 1. Quantitative analysis of fauna remains found in the site at Poiana.

Species	NR	%	NMI	%
<i>Bos taurus</i>	418	52.3 8	17	37.7 7
<i>Equus caballus</i>	26	3.26	3	6.67
<i>Sus domesticus</i>	243	30.4 5	16	35.5 6
<i>Ovis aries/Capra hircus</i>	93	11.6 5	6	13.3 3
<i>Canis familiaris</i>	18	2.26	3	6.67
Total domestic mammals	798	100	45	100
<i>Capreolus capreolus</i>	6	8.7	2	11
<i>Castor fiber</i>	1	1.5	1	5.6
<i>Cervus elaphus</i>	37	53.6	4	22.2
<i>Sus scrofa</i>	20	29	9	50
<i>Ursus arctos</i>	1	1.4	1	5.6
<i>Canis vulpes</i>	4	5.8	1	5.6
Total wild mammals	69	100	18	100
Total mammals	867			
Mollusca	50			
Aves	17			
Determined remains	934			
Undetermined remains	589			
Total sample	1523			

NR-number of specifically determined bone remains;
NMI-minimum number of estimated individuals.

Capreolus capreolus. On the basis of the six bone remains identified, of which there was a fragment of skull and five bone of the

appendicular skeleton, we estimated a minimum number of two individual animals, a mature one and an immature one.

Canis vulpes. For this species we identified three bones of the appendicular skeleton and a mandible, all of one adult individual animal.

Ursus arctos. One single bone belong to this species. It is a cubitus of an adult animal.

Castor fiber. In this sample we also identified an incisor tooth of this species.

The strategy of exploiting domestic animals

Bos taurus

Estimation of the age at which horned cattle were slaughtered was made on the basis of dental eruption and decay (UDRESCU *et al.*, 1999), as well as taking into account the epiphysal stage of the metapodials. Cattle were slaughtered mostly at adult age (tables 2 and 3). Within the live stock cows were in a greater number compared with the number of oxen and castrated oxen.

Table 2. Slaughter age of *Bos taurus* on the basis of dental eruption and decay.

Age	6 month	2,5-3 years old	3-4 years old	4-5 years old	5-6 years old
NMI	2	4	3	2	2

Table 3. Slaughter age of *Bos taurus* on the basis of the epiphysal stage of the metapodials.

nonepiphysal metapodials (until 2,5 years old)		metapodials * (about 2,5 years old)		epiphysalled metapodials (over 2,5 years old)	
NR	NMI	NR	NMI	NR	NMI
1	1	1	1	16	11

* metapodials in the process of getting epiphyses

Sus domesticus

We estimated the age at which the 16 animals were slaughtered considering the mandibles and the maxillaries wearing teeth, the stages of dental eruption and decay. We noticed that the animals were preferably

slaughtered at the age of about two years old (Table 4). This species was bred exclusive for the meat.

Table 4. Slaughter age of porcine on the basis of dental eruption and decay.

Age	0-1 year old	1-2 years old	2-3 years old
NMI	5	8	3

Morpho-metric data of the domestic animals archaeozoologically identified

We could perform only a limited number of measurements because of the high degree of bone fragmentation. Because of the small number of whole bones, we could estimate the height at withers only for three species (*Bos taurus*, *Sus domesticus* and *Equus caballus*). We could not appreciate the variability of this parameter within the whole live stock.

Bos taurus. The dimensions found as a result of the measurements we took are recorded in table 5. The height at withers, estimated on the basis of four metapodials (table 6) presents an average of 1086.6 mm (with Fock index, 1966). The cattle had *brachyceros* horns (short, gracile). We measured two horns (121 mm, 130 mm in girth at the base; 43 mm, 50 mm the large diameter and 32 mm, 33 mm the small diameter at the base; 112 mm, 128 mm maximum length); their flattening indexes were 76.7 and 64.

Equus caballus. Estimation of the height at withers was made measuring two metatarsus (table 5) and the values recorded are: 142.8 cm and 131.1 cm (after the index of Kieseewalter, 1880).

Sus domesticus. The average height at withers for this species (table 5), estimated on the basis of four bones (metacarpus IV, metatarsus III and two astragalus) is 75 cm. We made a dispersion diagram for the lower molar 3 and we also distinguished a difference from the wild boar (fig. 2).

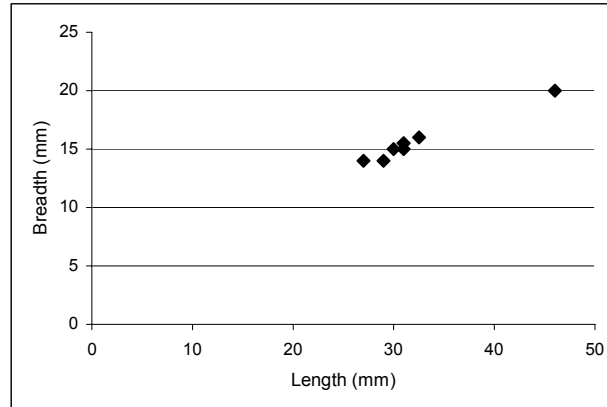
Figure 2. Dispersion diagram of M₃ of *Sus domesticus* and *Sus scrofa*.

Table 5. Osteometric measurements (mm).

Species	Anat. elem.	Dimension	N	Minimum	Maximum	Average
<i>Bos taurus</i>	Astragalus	lateral length	1 5	56,5	67,5	60,83
		medial length	1 3	53,5	64	56,5
		distal breadth	1 6	35,5	45,5	38,84
		lateral height	1 5	30,5	37	33,8
		medial height	1 5	27,5	38,5	31,2
	Centrotarse	Maximum breadth	3	49	52,5	50,5
	Phalanx 1	Length	1 2	51	66	55,2
		proximal breadth	1 2	25	31,5	30,4
		distal breadth	1 1	25	30	28,13
		minimum breadth of diaphysis	1 3	20	26,5	24,92
	Phalanx 2	Length	5	37	40,5	38,6
		proximal breadth	5	27,5	31	29,4

		distal breadth	4	22,5	26	24
		minimum breadth of diaphysis	5	21	23	22,2
Phalanx 3		Length	2	58; 67		-
		articular surface breadth	2	16,5; 21		-
		maximum breadth	2	19; 25		-
		dorsal face length	2	45; 52		-
		articular surface length	2	22; 27,5		-
Humerus		distal breadth	1	72?		-
		distal articular surface breadth	1	65		-
Metacarpus		Length	3	173	196	182
		proximal breadth	4	49	62	56,5
		distal breadth	6	47	59,5	52,33
		minimum breadth of diaphysis	3	25,5	33	28,33
		ant/post. proximal diameter	4	31,5	40	36,12
		ant/post. distal diameter	6	27	32,5	28,16
Metatarsus		Length	2	203; 205		-
		proximal breadth	3	41	46	44
		ant/post. proximal diameter	3	37	44	40,66
		distal breadth	5	42	59	52
		minimum breadth of diaphysis	2	24,5; 25,5		-
		ant/post. distal diameter	5	23	34	28,1
Radius		distal breadth	1	71		-
		proximal breadth	2	68; 69,5		-
		proximal articular breadth	3	63	63,5	63,17
		ant/post. proximal diameter	2	37,5; 37,5		-
Tibia		distal breadth	6	55	61	57,67
		ant/post. distal diameter	6	41	48	42,5
Scapula		glen. cavity length	2	54?; 58		-
		glen. cavity breadth	2	47; 51		-
Mandible		condyle length	2	39; 41		-
		condyle breadth	2	16,5; 19,5		-

	M ³	Length	4	25	29,5	27
		breadth	4	17	19,5	18,37
<i>Capra hircus</i>	Humerus	Distal breadth	2	30; 32		-
		Distal articular breadth	1	29,5		-
<i>Ovis aries</i>	Humerus	Distal breadth	1	31		-
		Distal articular breadth	1	27		-
	Tibia	Distal breadth	1	26		-
		ant/post. distal diameter	1	19		-
<i>Ovis/Capra</i>	Radius	Distal breadth	1	29,5		-
		Distal articular breadth	1	26		-
	Tibia	Distal breadth	2	25; 25,5		-
		ant/post. distal diameter	2	18,5; 20		-
<i>Sus domesticus</i>	Astragalus	maximum length	2	40; 42,5		-
		medial length	2	37,5; 38,5		-
	Phalanx 1	length	2	34,5; 36,5		-
		proximal breadth	2	14; 14		-
		minimum breadth of diaphysis	2	11; 12		-
	Femur	distal breadth	1	47		-
	Humerus	distal breadth	2	36; 42		-
		distal articular breadth	2	27,5; 32		-
	Metacarpus IV	maximum length	1	74		-
		distal breadth	1	17,5		-
		minimum breadth of diaphysis	1	14		-
	Metatarsus II	maximum length	1	63,5		-
		distal breadth	1	8,5		-
	Metatarsus III	maximum length	1	78		-
		medial length	1	74,5		-
		distal breadth	1	14		-
		minimum breadth of diaphysis	1	11		-
	Coxal	acetab.cavity length diameter	3	25,5	31	28,17
		acetab.cavity breadth diameter	3	25	31	27,67
	Mandible	simphyse length	1	65		-
	Tibia	distal breadth	2	27,5; 28		-
M ₃	length	6	27	32,5	30,08	
	breadth	6	14	16	14,91	
M ³	length	3	29	32,5	30,66	

		breadth	3	17	17,5	17,16
<i>Equus caballus</i>	Cuneiform	maximum breadth	2	46,5; 48		-
	Phalanx 1	maximum length	1	82		-
		distal breadth	1	45,5		-
		minimum breadth of diaphysis	1	34,5		-
		distal articular breadth	1	44		-
	Femur	distal breadth	1	94		-
	Metacarpus III	distal breadth	1	48		-
		ant/post. distal diameter	1	36,5		-
	Metatarsus III	maximum length	1	255		-
		lateral length	2	246; 268		-
		proximal breadth	1	47,5		-
		distal breadth	2	46; 48		-
		minimum breadth of diaphysis	2	31,5; 31,5		-
Tarse-scafoïd	ant/post. distal diameter	1	38		-	
	maximum breadth	1	55		-	
<i>Cervus elaphus</i>	Astragal	lateral length	3	55	58	56,83
		medial length	3	51	53,5	52,67
		Distal breadth	2	35; 36		-
		lateral height	2	30; 32		-
		medial height	3	25	31	29
	Calcaneus	Maximum length	2	122; 126		-
		Maximum breadth	2	39; 40,5		-
	Phalanx 1	Maximum length	1	68		-
		proximal breadth	1	26		-
		distal breadth	1	23		-
		minimum breadth of diaphysis	1	20		-
	Metacarpus	proximal breadth	1	47,5		-
		ant/post. distal diameter	1	34,5		-
	Radius	proximal breadth	1	60,5		-
		Proximal articular breadth	2	57,5; 61		-
ant/post. proximal diameter		2	36; 38		-	

Table 6. Estimation of the sex and withers height for *Bos taurus* (mm).

Anatomic element	maximum length	proximal breadth	breadth diaphyses	distal breadth	Sex	Withers height
Metatarsus index	203 -	41 20,19	24,5 12,06	48,5 23,89	F	1086,05
Metatarsus index	205 -	46 22,43	25,5 12,43	55 26,82	C	1117,25
Metacarpus index	173 -	- -	33 19,07	59,5 34,39	M	1081,25
Metacarpus index	177 -	-	25,5 14,4	49 27,68	F	1062

Conclusions

In the sample analyse, bone remains from domestic mammals are in the greatest number and this demonstrates that breeding animals was of particular importance in the food economy of the community.

Bone remains from cattle are the greatest in number. The cattle breed was of relatively low high and had *brachyceros* horns. In most cases they were slaughtered at an adult age.

Second in number of bone remains were the porcines and then the ovicaprines.

The presence of numerous bone remains from wild boars and stags prove the fact that the area surrounding the settlement was well afforested at that time.

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