
PRELIMINARY ARCHAEOZOOLOGICAL
COMPARATIVE DATA CONCERNING
THE HUSBANDRY IN CHALCOLITHIC
COMMUNITIES OF PODURI, FETEȘTI
AND TÂRGU NEAMȚ (CUCUTENI B PHASE)

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Introduction

Cucuteni Culture appeared and spread in the eastern of Romania, over a millennium (4600-3500 B.C.) (Mantu, 1998). Belonging to the phase Cucuteni B we studied domestic mammal's remains excavated from three sites: Poduri-Dealul Ghindaru (Bačău County), Fetești-La Schit (Suceava County) and Târgu Neamț-Dealul Pometea (Neamț County).

Materials and methods

The archaeozoological analysis of the faunal assemblages was achieved in the Laboratory of Animal Morphology, Faculty of Biology, „Alexandru Ioan Cuza” University of Iași, mainly consisting of anatomical and taxonomical identifications, age and sex estimation, encoding and quantification of data (Udrescu *et alii*, 1999).

Results and discussions

In the *tell* of Poduri (Cucuteni B) out of the 8967 bone remains specifically identified, 8030 belong to domestic mammals (representing 89.55%), and the rest to hunted wild animals. In the site of Fetești (Cucuteni B) out of the 636 skeletal fragments, 543 are domestic (85.35%) and 93 are wild. In the archaeological site of Târgu Neamț there were analyzed only bone remains of domestic animals that belong to class *Mammalia*.

Husbandry is the main human occupation to satisfy the steady demand for meat and other products derived from domestic animals (hides, wool, milk). The domestic mammals, mainly identified in samples of the Cucuteni B phase are represented by cattle (*Bos taurus*), then ovicaprine (*Ovis aries* / *Capra hircus*), pig (*Sus scrofa domesticus*), a classification done both according to the number of skeletal elements, as well as the number of specimens (tab. 1). Few skeletal remains are attributed to dog (*Canis familiaris*). In the samples of Cucuteni B phase identified in the literature, show a prevalence of the domestic mammals in number of bone remains and specimens.

In the analysed archaeozoological samples of Cucuteni B phase it was recorded a progressive decrease in the frequency of the number of cattle remains and an increase of the ovicaprine stock, thus requiring a comparative analysis of the frequency of domestic mammals (*Bos taurus*, *Ovis aries* / *Capra hircus*, *Sus scrofa domesticus*) in the Precucuteni-Cucuteni cultural complex and the synchronous Gumelnița culture.

Comparing with another sites, assigned to Cucuteni B phase, it was observed that in sites of Valea Lupului, Mitoc and Cucuteni, the proportion of skeletal elements of domestic mammals is the lowest, ranging from 70.28%, 70.89% and 71.17%, while the highest frequency of domestic mammalian bone fragments is identified in the Mihoveni site (87.36%) similar values also being recorded at Ghelâiești (85.72%) and Liveni (83.31%).

Comparing the share of the mammalian bone fragments, identified in Cucuteni B phase, with the synchronous occurrence in south-eastern Romania (Gumelnița B), it was observed the prevalence of domestic mammals to the detriment of the hunted, which are predominant at Gumelnița B. In the archaeological sites Bușani, Drăgănești and Vitănești (Gumelnița B) it was identified the lowest frequency of domestic mammals remains (64.20%, 58.90% and 58%, respectively) and the highest at Vladiceasca (96.20%), a value close to that at Dumești (Cucuteni A), Măriuța (86.50%), a share similar to that at Fetești, Ghelâiești and Mihoveni (Cucuteni B) and Gumelnița (81.90%).

Bos taurus

The low frequency of domestic cattle (*Bos taurus*) bone remains in the archaeological samples belonging to the Cucuteni A phase compared to the Precucuteni culture is determined by aridity and nutrient depletion in the soil and the environment as a result of intense exploitation of the species, population growth and the expansion of the settlements; the frequency of the bone remains identified for *Bos taurus* in the sites, assigned to Cucuteni B phase (presented in the literature) is slightly lower compared to the Precucuteni culture.

The transition to Cucuteni A phase is demonstrated by the reduced frequency of cattle specimens, as a result of the aridity of the environment and the increased demands of the species for the environmental conditions; in Cucuteni B phase the frequency of the *Bos taurus* specimens is intermediate between the Cucuteni period of Precucuteni and that of Cucuteni A phase, but much higher compared to the frequency of individuals of this taxon in the sites belonging to Gumelnița B.

In the sites of Poduri, Fetești, Târgu Neamț (Oleniuc, 2010) and Cucuteni (Haimovici, 2004, p. 241-251) belonging to Cucuteni B phase, we observed that the specimens of *Bos taurus* were slaughtered mainly at the age of 6-8 years. In the *tell* of Poduri (Cucuteni B) 50 specimens were attributed to domestic cattle. For the 8 horn pieces, 4 whole metapods and 2 lower jaws, it was assessed the predominance of female individuals (animals used as sources of milk and its derivatives, also an important food source, also having the reproductive capacity to increase the herd).

The presence of geld individuals as well as the frontal part of the eviscerated skull of domestic cattle, having a basal horn with smooth cut-marks in the *tell* of Poduri (Cucuteni B) indicate the selectivity of the Chalcolithic population for gracile and massive specimens, that could be used in agricultural work. Only in the *tell* of Poduri (Cucuteni B) there were taken metric data from 8 horns of *Bos taurus*. Based on the flattening index it was assessed the presence of one geld individual (92.64), 3 females (the average is 64.47, with the minimum of 60.91 and a maximum of 66.67) and 4 males (with a range of variation between 73.73 and 78.90, for which it was set an average of 76.17). The *brachycheros* type is generally attributed to females and the *primigenius* type is characteristic of males. In the Neolithic samples from Moldavia, the dimensions of the horn processes are much larger than those in the late Chalcolithic period (Cucuteni B) and the synchronous archaeological sites (Gumelnița B). The geld horn core belonged to a old individual of cattle (killed at 8-10 years – stage V). The females horn cores of cattles belonged to exemplars slaughtered at stage IV (6-8 years) in comparison with males ones that had been killed at stage III (4-6 years).

The 2 whole metatarsi of *Bos taurus* (1 on left side and 1 on the right) identified in the *tell* of Poduri (Cucuteni B), correspond through their maximum length (231.2 mm and 232 mm, respectively) and their distal epiphysis index (of 26 and 25, respectively) to geld specimens, with withers height of 126.33 cm and 126.44 cm respectively. The 2 domestic bovine metacarpi correspond to a geld individual and a male. One right metacarpus, attributed to the geld individual, has a length of 192 mm. The distal epiphysis index (I_4) was calculated at 31.25 mm and the withers size is 117.30 cm. The left metacarpus of domestic bovine, characteristic of a male specimen, has a maximum length of 195.2 mm. The distal epiphysis index was calculated at 35.86, and withers size is 122 cm.

Sheep / goat Breeding Group

In Cucuteni B phase of the total number of ovicaprine bone remains in Valea Lupului and the eponymous station, there were identified predominantly bone remains of *Ovis aries* (15.75% and 13.46%, respectively) in detriment to the goat. This situation is similar in Cucuteni B phase at Poduri and Fetești, where there were identified more sheep skeletal elements, which represent 3.40% and 2.80%, respectively). The transformations that occurred at the end of the Precucuteni period and the beginning of Cucuteni A phase (unlike the synchronous Gumelnița B) are emphasized in the economy by increasing the share of bone remains and the number of ovicaprine specimens, due to the increase of environmental temperature and the decline of nutrient resources. In all Chalcolithic sites of the Cucuteni B phase predominate the slaughtering of the adult individuals of 4-8 years of sheep / goat, which suggests their use for secondary products and to increase the flock.

Ovis aries

In the *tell* of Poduri (Cucuteni B) out of the 3029 ovicaprine bone fragments, only 103 skeletal elements belong to sheep, representing 1.14%. Of the 25 adult ovicaprine specimens, 12 individuals were attributed to the taxon *Ovis aries* (48%). In the site of Fetești (Cucuteni B) there were identified 6 sheep skeletal elements (0.94%), which were attributed to a mature specimen (10%). In the *tell* of Poduri (Cucuteni B) there were found two neuro-cranial fragments, one specific to the hornless type, and a parieto-occipital fragment with right suture belonging to the taxon *Ovis aries*. Such specimens predominate in the archaeological sites of the Neolithic period, but they were also identified in the final stages of the Chalcolithic period (the synchronous cultural aspect), as well as in the early stages of the Bronze Age, representing an advanced stage of domestication (Bököny, 1973, p. 69-75). The frequency of sheep bone remains (out of the total ovicaprine remains) in the evolution of the Precucuteni-Cucuteni cultural complex and compared with the

synchronous Gumelnița culture, decreases gradually due to the environment aridity and the diminishing food resources. In the archaeological sites belonging to the Gumelnița culture there were identified several sheep bone remains due to the lack of rough terrain and the location of the Chalcolithic settlements in low altitude areas. The flattening index, calculated for the 3 goat-looking horns indicates the predominance of the female specimens in the site of Poduri (Cucuteni B). In the *tell* there were measured 3 sheep horns (*Ovis aries*) with the average flattening index of 48.11 (ranging between 47.22 mm and 48.88 mm), which corresponds to adult female specimens. The female horn processes of *Ovis aries*, identified in archaeological sites belonging to the Cucuteni B phase are goat-like. In the *tell* of Poduri (Cucuteni B) there were identified 3 whole sheep metacarpi. The smallest withers size of sheep were estimated of 54.80 cm and the biggest of 62.56 cm and 62.80 cm. In the *tell* of Poduri (Cucuteni B) it was identified one radius. The height of the withers estimated is 51.97 cm.

Capra hircus

In the *tell* of Poduri (Cucuteni B) out of the 3029 ovicaprine bone fragments, 100 were attributed to the domestic goat, representing 3.30% and / or 1.11% of total number of bone remains that were identified. Of the 25 mature individuals attributed to the ovicaprine group, at least 13 adult specimens belong to domestic goats (52%). In the archaeological site of Fetești (Cucuteni B) 2 remains were attributed to goat (representing 0.31%) from the same individual (10%). The frequency of goat bone remains (of total number of ovicaprine remains that were identified) drops abruptly from Cucuteni A phase to the Cucuteni B phase. In the *tell* of Poduri (Cucuteni B), 3 of the 13 goat horns belong to females and 10 to males. In the site of Fetești (Cucuteni B) it was identified 1 goat horn that belongs to a female. Domestic goat horns are sword-like, *prisca* type.

Calculating the flattening index of the 13 domestic goat horns, identified in the *tell* of Poduri (Cucuteni B), revealed that there were 3 females and 10 males. The flattening index of the female horns of *Capra hircus* varies between 58.87 mm and 61.51 mm, and 67.44 mm to 78.76 mm for males (Prummel, Frisch, 1986).

The withers size, calculated for a whole goat metatarsus, in the *tell* of Poduri (Cucuteni B), is 58.26 cm, corresponding to the maximum length of 109 mm and minimum diaphysis width of 13 mm. The distal epiphysis index (I_4) is 22.47, and the diaphysis index (I_3) is 11.9. It was identified a radius of goat also. Its height of the withers was estimated of 58.26 cm.

Sus scrofa domestica

It is ranked third in the samples of Cucuteni B phase, except in the Mihoveni (Haimovici, 2001, p. 145-157) and Mitoc (Haimovici, 1986, p. 77-81) sites (where the pig holds the second place 20.48% and 7.69%). In the *tell* of Poduri (Cucuteni B) 1402 pig skeletal remains were identified, representing (17.45%) and in the site of Fetești (Cucuteni B) 85 pig skeletal elements were analyzed (15.65%). Small percentages of pig bone remains were found in the samples of the Cucuteni B phase at Cucuteni (6.61%), Valea Lupului (7.71%) (Haimovici, 1962, p. 291-321), Liveni (8.38%) (Haimovici, Ungurianu, 2002, p. 279-291), Ghelăiești (6.53%) (Haimovici, Stan, 1986, p. 693-698) and Târgu Neamț (6.38%).

The predominance of the pig skeletal elements and of the number of specimens identified in the Chalcolithic samples that belong to the Gumelnița culture are intermediate between those characteristic of the Cucuteni A phase and those obtained in the Cucuteni B phase and Precucuteni culture. The share of the number of specimens attributed to swine in the Cucuteni A phase is two times higher than the frequency of the specimens, mostly juveniles, of *Sus scrofa domestica* identified in Cucuteni B phase. In both phases (A and B) of the Cucuteni culture, as well as in the Gumelnița culture, it was observed the prevalence of piglets and subadult individuals (70-80%). The presence of mature individuals in the *tell* of Poduri (Cucuteni B) can be supported by the interest to maintain the herd. In the site of Fetești (Cucuteni B) 3 specimens of domestic pig were analyzed. The gender ratio is 1 : 2. In the *tell* of Poduri (Cucuteni B) there were analyzed 15 specimens of domestic pig. There were found 3 female and 12 male specimens. The gender ratio is 1 : 4, indicating a strict gender selection in domestic pig.

The preponderance of male specimens at the expense of females is supported in particular by the use of the domestic pig especially for the primary *products* (meat and fat), while the presence of adult females is explained by the reproductive capacity and the increase of the herd in the Chalcolithic settlements. The first metatarsal IV of pig (with the total length of 85.2 mm, the withers size was calculated to be 77.41cm) and the metacarpus III (with the length of 78 mm, for which the withers size was calculated to be 80.74 cm) correspond to male specimens. The second metatarsus IV of pig with the length of 81.3 cm, it was estimated a size of 71.4 cm, corresponding to a female. All pig specimens identified in the studied sites are the *palustris* type.

The withers height, calculated according to the 5 pig astragals, range between 68.5 cm and 82.85 cm, with an average of 74.79 cm. The relatively uniform metric data indicate, for the late Chalcolithic period in south-eastern Romania and Cucuteni B phase the existence of crossbred populations (resulting from the interbreeding of the domestic species with the wild species), due to the semi-free living conditions.

Canis familiaris

The dog is the first animal domesticated by humans 12,000 years ago, the wolf being considered its ancestor. It is a medium-sized carnivorous mammal, used in the Chalcolithic for guarding, as companion for hunting or for its fur (Ion, Ion, 2002).

In the *tell* of Poduri (Cucuteni B) there were identified 134 dog skeletal remains (3.15%) from at least five adult specimens (3.44%), in Fetești (Cucuteni B) there were analyzed 17 dog bone fragments (2.67 %) from 1 adult specimen (2.17%) and in site of Târgu Neamț (Cucuteni B) there were found 2 dog skeletal elements (4.25%) from the same mature individual (11.11%).

Calculation of basal skull length of *Canis familiaris* (according to Dahr's indices) emphasized the presence, in the *tell* of Poduri (Cucuteni B) 3 types of dogs: small (*palustris*, with the basal skull length of 124.78 mm and 147.40 mm, respectively), medium size (*intermedius*, with the basal skull length of 157.55 mm) and large, with the range of the basal skull length (for 5 skeletal elements) between 160.45 and 166.25 mm, with an average of 163.17 mm.

The dog basal skull length, in the *tell* of Poduri (Cucuteni B), calculated according to the index Brinkmann I, there were identified only small dogs (*palustris*, of 145.20 mm and 148.83 mm, respectively). The *palustris*-type dog was identified, using the index Brinkmann II, as having a basal skull length of 148.64 mm, while the *intermedius* type had a basal skull length of 150.15 mm). In the studied sample the presence of a dog mandible, with the jugal length of 71.5 mm, allowed the estimation of the Dahr index (basal skull length) to 163.35 mm, which is typical for a large specimen.

Conclusions

Husbandry is the main human activity in order to ensure a steady supply of meat and other secondary products from domestic animals (hides, wool, milk). The domestic mammals, identified in the analyzed Cucuteni B sites are: domestic cattle (*Bos taurus*), sheep / goat (*Ovis aries* / *Capra hircus*), pig (*Sus scrofa domesticus*) and dog (*Canis familiaris*). In the studied sites of Poduri, Fetești and Târgu Neamț there were butchered predominantly specimens from the ovicaprine livestock, aged between 4 and 6 years, and for the domestic cattle between 6 and 8 years, which suggests the exploitation of these animals mainly for the secondary products (wool, milk, hides) and then for meat.

In the Cucuteni B phase the female, geld, and the male individuals of domestic cattle have the height of the withers (calculated according to metapods) much smaller and gracile than in the Cucuteni A phase, Precucuteni culture and Gumelnița culture. The withers size for *Ovis aries* and *Capra hircus*, calculated according to the metacarpus, in the *tell* of Poduri is much larger than the withers size assessed in the Gumelnița culture.

In the *tell* of Poduri (Cucuteni B) the withers size (calculated according to metapods and astragal) for the species *Sus scrofa domesticus* is larger than in Precucuteni culture and similar to the withers height assessed in the Cucuteni A phase and Gumelnița culture. Calculating the basal skull length of *Canis familiaris* (according to Dahr's indices) emphasized the presence 3 types of dogs: small (*palustris*, with the basal skull length of 124.78 mm and 147.40 mm, respectively), medium size (*intermedius*, with the basal skull length of 157.55 mm) and large, with the range of the basal skull length (for 5 skeletal elements) between 160.45 and 166.25 mm, with an average of 163.17 mm.

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Samples	Poduri				Fetești				Târgu Neamț			
	NISP	%	MNI	%	NISP	%	MNI	%	NISP	%	MNI	%
<i>Bos taurus</i>	3465	38.64	50	34.48	227	35.69	12	26.08	37	78.72	5	55.55
<i>Ovis / Capra</i>	2826	31.51			206	32.38	8					
<i>Ovis aries</i>	103	1.14	12	17.24	6	0.94	1	21.73	5	10.63	2	22.23
<i>Capra hircus</i>	100	1.11	13		2	0.31	1					
<i>Sus scrofa domesticus</i>	1402	15.63	15	10.34	85	13.36	8	17.39	3	6.38	1	11.11
<i>Canis familiaris</i>	135	1.49	5	3.44	17	2.67	1	2.17	2	4.25	1	11.11
Total	8030	89.56	95	65.51	543	85.35	31	67.37	47	100	9	100

Tab. 1. The frequency of domestic species in the studied samples, belonging to Cucuteni B phase (according to NISP and MNI)

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