

THE ANIMAL HUSBANDRY OF CERNAVODĂ III COMMUNITIES

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The archaeological investigations carried out in the area of the today Cernavodă town produced a substantial amount of faunal remains by 1956-1970's diggings belonging to three cultural horizons usually designated as Cernavodă I, Cernavodă II and Cernavodă III cultures, corresponding to three distinct settlements.

A small part of animal bone remains (uncovered throughout the 1958, 1960, 1961's diggings) were analysed and published many years ago (Haimovici, Ureche 1968, 291-308). In the present study we shall focus our attention on other two faunal collections (about 1,664 fragments) related to the Cernavodă cultures. Initially, we intended to deal only with the faunal sample from Cernavodă III settlement. The analysis of another lot of bone material connected with the Cernavodă I culture had become imperiously, in order to enrich the scarce enough data revealed so far. Therefore, along the discussion that follows, the two sites will be treated together. On the other hand, the remains of the Cernavodă II culture are too scarce to be described.

Table 1. Frequencies of species

	Cernavodă I				Cernavodă III				Cernavodă II	
	FRGM.	%	MNI	%	FRGM.	%	MNI	%	FRGM.	
Bos taurus	122	20,1	14	15,2	289	33,9	43	23,1	11	
Ovis/Capra	169	27,9	32	34,7	269	31,6	84	45,1	16	
Sus s. domesticus	110	18,2	18	19,5	93	10,9	24	12,9	3	
Canis familiaris	22	3,6	6	6,5	44	5,4	13	6,9		
Equus caballus	31	5,1	3	3,2	37	4,3	5	2,6		
Domestics	454	75,1	73	79,3	732	86	169	90,8	30	
Cervus elaphus	86	14,2	7	7,6	69	8,1	7	3,7	8	
Sus s. ferrus	24	3,9	4	4,3	26	3	4	2,1	3	
Bos primigenius	30	5,1	3	3,2	15	1,7	3	1,6	6	
Capreolus capreolus	6	0,9	2	2,1	6	0,7	2	1	2	
Martes martes					3	0,3	1	0,5		
Meles meles	1	0,1	1	1						
Vulpes vulpes	1	0,1	1	1						
Lynx lynx	1	0,1	1	1						
Wilds	150	24,8	19	20,4	119	13,9	17	9,1	19	
MAMMALS	604	100	92	100	851	100	186	100	49	
Undetermined	31									
Pisces	27				16					
Unio sp.	49				29					
Tools	6				1				1	
TOTAL	717				897				50	
								1664		

The Cernavodă III settlement is located on the "Sofia" Hill, within the today Cernavodă town, on the right bank of Danube. Quantitative statistical analysis of the proportions of species shows the following situation: the remainders are only carnivorous food and butchery refuses. Butcher marks on these assemblages are lesser. Traces of burning are quite frequent. The list includes six domestic and nine hunted mammals. The bone measurements were taken following the standards published by von den Driesch (1976).

Domestic and wild cattle

The samples of domestic cattle summarize 33,9 % of the whole Cernavodă III bones sample. As MNI (minimum number of individuals) the species ranks the second. Aurochs bones, about 1,7 % of total fragments, are sparsely present. The collection includes an important number of measurable bones. The most part of measurements was taken on mandibles and teeth. Most frequent are fragments of skulls, especially horn cores. In almost all cases the horns were cut off near the base. For many pieces the tips are damaged, few of them are thoroughly measurable. Out of eleven horn cores five come from males exemplifying the *primigenius* type. The pieces are heavy, with thick walls, marked by grooves, slightly curved forwards and upwards. Almost all pieces come from adults, excepting one of a sub-adult individual. The three female horns illustrate the *brahyceros* type. They are of medium size, with thin and smoothed walls, curved forwards. In addition to the animals of both sexes, castrates are also present. Other three pieces slightly curved, with deeply furrowed walls originate from oxen. No horn cores of aurochs were uncovered in the Cernavodă III culture. Only one piece was collected from the other settlement. It is medium sized, with thick walls, and a moderate curvature, illustrating a female. Some horn cores of domestic cattle (unidentified sex) are quite odd by their peculiar shape. They have an oval cross-section; the outer face is flattened and outlines a triangle-like section at the top. The surface is less smooth, with marked grooves, particularly on the flat face. This type has been already defined in the other analysis of a Cernavodă sample (Haimovici, Ureche 1967). The sex-ratio of three females: eight (males-castrates) is rather unusual. This report supports the presumption of an extensive killing of adult males for meat and the keeping of females up to a mature stage. The dimensions of the horn cores fill into the variation span throughout the Eneolithic and Transition epochs' cattle (Haimovici, Gheorghiu-Dardan 1970, 562; Haimovici 1996, 380). The maxilla dimensions taken into the cattle sample show the next values of $M_1 - M_3$ (82.5-88) and length of M_3 (29.5-34). For wild cattle values of 93-98 ($M_1 - M_3$) and 35-38 (M_3) were noted. One can see higher values of M_3 closely to those of wild form. A certain variability is also apparent into the mandible measurements. $M_1 - M_3$ varies between 81-90 mm in case of cattle and 94-98 mm for aurochs. The length of M_3 exhibits the following variation span: 35-41 (cattle) and 43-45 (aurochs). In general, the bovine dentition is big-sized opposite to the slenderness of mandible bodies. Most part of aurochs long bones were brought up to light on the Cernavodă I settlement. However, a metacarpus with Bd/Dd of 80/43 mm point out a strong animal (maybe a bull). Also a talus with GL of 94 derives from a male (Bolomey 1968, 26). Both pieces come from the Cernavodă III samples. The cross-plots of talus GL versus Index (distal width x 100/GL) (Ambros 1968, 448) clearly reveal a gap between the two forms. Likewise, the sex differences are obviously on the diagram (fig. 4). In the case of the first phalanx, a value of 78/48 mm (GL/BP) was recorded. Relating to the third phalanx, some of them come from aurochs. Exemplifying by some cases, the diagonal length is 97; 100 mm.

A complete metacarpus was collected from the Cernavodă III settlement. A withers height of 100.7 cm (Matolcsi quotient) was supposed. The small stature of the cow is not conformingly to the well-known type from the Transition epoch. Another 192 mm long metacarpus, distal unepiphyseal, suggests a sub-adult male. Its tallness would have been exceeded 118 cm at the maturity. Values of 116-118 cm (females) and 125,8 cm (males) were supposed for this period (Haimovici, Ureche 1968). As far as the available measurements suggest all animals were of medium size, some robust individuals fell into wild cattle size range. Presumably, by human action or sporadically, there was a crossbreed between the two forms. The wild cattle bones from both settlements belong to animals hunted at an adult/mature stage. One of them was three years old. The hunted individuals were entirely brought back on the site for butchering as the wide distribution of meat-poor elements supposes.

Sheep and Goat

Ovicaprines occur in very high quantity in Cernavodă III samples, 31,6 % (fragments) and 45.1 % (MNI). In the Cernavodă I culture it represents 27.9 % of total fragments and 34.7 % as MNI. The two species form the most numerous group of mammals at both phases. The distribution of ruminant body parts is affected by the significant percent of bones from young specimens (shattered during time) and by recovery procedure. Consequently, a high frequency of mandibles is characteristic to them. The sheep represent the overwhelming majority with forty-five fragments opposite to the sixteen from goat. The prevalence of skull elements made difficult the separation of the two species. The sheep is a strong animal with horns for both sexes. Among sheep bones, three horn cores come from males and five from ewes (Cernavodă III). For that reason the distribution of these elements show a 5:3 ratio for the female: male sex-ratio (two pieces of rams are not measurable). Hornless ewe skull fragments were not found. The ewe horn cores are not quite short (as usual). They are of goat types, untwisted and flattened. The single measurable ram horn core is relatively strong, with a slightly curvature backward. Its morphology is very different from the *Copper Age* type. Thus the medio-nuchal surface is flat, the lateral one is convex, and the base cross-section becomes convex-plane. The third face is not visible. The anterior edge is sharper than the posterior one. The lateral face becomes slightly rounded to the tip with a sharp aboral edge. These patterns could be considered as characteristic for the most part of the rams from the site. A horn core of this type was also found in the Eneolithic site from Drăgușeni (NE Moldavia) (Bolomey, El Susi, under press) and in other sites of the same epoch (Haimovici 1996, 382). A single ewe horn core of the aforementioned type was found in Cernavodă I sample.

All the six goat pieces are of *prisca* type, belonging to females. One of them originates from a sub-adult animal and three are not measurable. According to horn core distribution, the percentage of goat remainders is higher than that on skeletal parts. The number of measurable maxilla and mandible fragments is substantial, though many had been broken. Maxilla measurements occurring in great number show the next values: M_1 - M_3 varies from 43 to 54 mm (X-49.8); length of M_3 from 20-26 mm (X-23.8). On the mandibles, the length of teeth row varies between 65-78 mm (X- 71.7); length of molar row is from 44 to 53 mm (X-48.9); M_3 measures 18-26 mm (X-23.3). Few measurements were collected from the long bone fragments. Most of them suggest animals relatively large as compared to the Neolithic epoch. Two metatarsi with the greatest length 132 mm and 144 mm originate from sheep of 61.7 and 67.2 cm (Talkin). Furthermore a talus of 29.5 mm and a calcaneus of 59 mm greatest length yielded

talls of 66.9 cm and 67.2 cm (Teichert). A tibia with total length of 218 mm suggests a sheep of 65.6 cm (Teichert). The dimension places the specimens into the middle size range of sheep found in the today sites (Haimovici, Popescu 1978, 119). The long bones from goat are missing therefore it is impossible to estimate the species stature. Several measurements suggest medium size animals. It has been supposed that the small ruminants of Cernavodă cultures belonged to the group of big-sized sheep which arrived in Europe during Copper Age and Bronze Age, in a certain measure connected to the expansion of the domestic horse (Bökönyi 1991, 554). Without connecting these sheep with the Neolithic stock, a second sheep wave had reached Romania from Southwest Asia, introducing the new type (Haimovici 1979, 18).

Domestic and wild pig

Out of 119 suid bones ninety-three originate from domestic pig and twenty-six from wild swine. Domestic pig is feebly represented during Cernavodă III culture (9.9 % of fragments) falling into the third place. By contrast, a higher percent of bones is estimated on the basis of the Cernavodă I dwelling (19,5 %). Wild swine is relatively unimportant in both sites, summarizing up to 4 %. The cranial elements are dominantly, accounting roughly 60 % of suid samples in the two phases of culture. The remains are broken and badly preserved except the skull elements. Besides, about 60 % of them come from young and sub-adult individuals; consequently, fewer measurements were taken from. Additional measurements on length/width of M_2 allowed a reliable assignment of fragments to either species. Hence the length/width of M_2 fluctuated between 16.5-21.5/13.3-16 mm in pig and 22-25/18-21 in wild swine (Bolomey, El Susi, under press). The length of M_1 - M_3 varies between 70-78 mm in the case of the domestic pig. Length of M_3 is 35-38 (X- 36.3) dappears in domestic form and 43-47mm in the wild one. Judging by slenderness of the canine development most part of head elements could be assigned to wild sows. Only two canines with greatest diameter at alveoli, 37; 39 suggest boars. Nothing can be said in the present stage of research on the stature of the two species. Whole sized bones were not preserved. For the moment, the few measurements reveal that suid population of Cernavodă were medium-sized lacking the transitional forms.

Dog

Forty-four fragments of species were found in Cernavodă III samples (9,4 %) and twenty-two (3.6 %) in the other settlements. The lack of cutting marks on bones (although attritional forces damaged some of them) would suppose dogs have not been eaten. Over half of remains belong to the skull element. Furthermore, metapodi are overrepresented in the post-cranial skeleton. Four incomplete skulls were preserved. All of them have the muzzle partially damaged, especially their dorsal face. Some morphological characteristics have been emphasized on pieces: the forehead has a convex profile, neurocranium is oval without sagittal crest, and parietals strongly arched. The occipital triangle is small medium heightened with a prominence in the upper part. Foramen magnum has a round shape. It seems that all skulls belong to *palustris* type (Haimovici, Ureche 1968, 294). Among mandibles, ten belong to *palustris-intermedius* categories (according to basal length of Dahr, Table 7). Three pieces exemplify big animals. A single mandible with a length of tooth row/length M_1 : 79/24 mm comes from a large animal. The bone probably originated from a robust dog, falling within the size range of a wolf. An interesting specimen is a left side mandible with the internal face polished without reaching a labored form. The mandibles are characterized by the following

dimensions: tooth row length varies between 59-76 mm (X-67.9) and M_1 length from 18 to 24 mm (X-20.3). Several mandibles are shorter, gracile, curved with small teeth. Frequently teeth are crowded especially P_4 versus M_1 . Other pieces are longer, sturdy, with gaps between premolar teeth.

Having measured two complete bones (*humerus* - 157 mm; *femurus* - 150 mm) body statures of 52.9 cm and 45.1 cm have been defined. The dimensions put the animals into the medium, and sub-medium categories. Most of the specimens are from adult animals; old exemplars were not found.

Horse

Domestic horse is quoted by thirty one bones (5.1 %) on Cernavodă I samples and by thirty seven bones (4.3 %) on the other ones. Remains were broken-up (excepting distal parts of legs) and scattered around the sites like the other mammal fragments. Most of bony remains come from meatless regions as phalanges and isolated teeth. The important percent of elements originating in meatless regions suggest the individuals had been slaughtered within the settlement (Bökönyi 1989-1990, 90). A left mandible with the destroyed aboral part yielded the next dimensions: length of diastema - 101 mm; height in front of P_2 - 64; length of incisor row 68. The bone originates from a stallion, 12-14 years aged. The piece is a little larger than that of the Dereivka skull and falls into the middle range size of domestic horse of kurgans (Bibikova 1986, 145). Another unmeasurable mandible with a weak canine belonged to an old female. A lot of removed upper and lower teeth were found. The enamel is moderately plied; below the wearing face two-three thicken girdles are visible. In the settlement of Cernavodă III a complete metacarpus was found. The bone is 211 mm in length with a wider proximal end and a narrower one. Distal length represents about 94 % from the proximal length. The tubercle of the proximal epiphyses on the dorsal face is feebly developed and roughly triangular-shaped. On the ventral side the imprints of the second and forth metacarpals are awfully delimited. Considering that the second metacarpal is not yet sutured with the third one can presume a young mature. The total length of the second metacarpus is estimated at 137 mm. The pieces distinguish themselves from other ones by a small value that estimates a stature of 128.8 cm (Kiesewalter). According to the diaphysis width index (17), the metacarpal falls into the *semi-thick legged* group (Bibikova 1986, 158). The proximal phalanges are in both sizes and proportions close to those from Dereivka (Bibikova 1986, 154). Surely they fall into the upper size range of those horses. Referring to the second phalanx they are also massive. on the other hand, the presumed horse individuals from our site are characterized by the massiveness of extremities, even though some of them would have had a small stature.

Red deer and roe deer

Red deer is the most prevalent hunted animal in both phases. It varies from a higher percent during Cernavodă I, 14.2% to a lower value, 8,1 % during Cernavodă III culture. Most of artifacts of both cultures were made of shed antler bases. Only one antler attached to pedicle was found, suggesting an animal killed during the winter. Its sample contains bones of all body parts unequally distributed, leading to the assumption that the hunted animals were wholly brought back. Several dimensions represent medium-sized animals. Roe deer is much less numerous than the red deer, with two pieces in the Cernavodă III sample. It is noteworthy a mandible originating from a mature animal and a distal humerus of an adult. Cernavodă I

sample provided a mandible of a sub-adult animal and five long bone ends. Two remains of human bones were found scattered in the cultural layer, all being fragmented.

THE MAMMAL EXPLOITATION STRATEGIES

Because of the assemblages cranial elements which are very numerous it is deemed reasonable to use mostly the MNI values in our statistics.

Ovis/Capra. Over half of the animals at Cernavodă I were killed particularly as *juveniles* (53.1 %). During their second year of life, the percentages decreases at 21.8 % (Table 2). Only 25 % of the presumed individuals were killed at an adult stage. Very mature animals were not evidenced. Such a distribution would imply an exploitation strategy limited to meat and hide. At Cernavodă III the age class profile suggests that 38 % of the flock was slaughtered yearly, while 26.4 % every two years. The adult-matures represents roughly 40 %. Individuals kept up to six years were also presumed. The age-ratio for this phase becomes more balanced, opposite to that of the earlier period, suggesting a breeding for milk rather than meat.

Cattle. The age distribution data relied on mandibles point towards a dominance of immature specimens in Cernavodă I sample (Table 2, 4, Fig. 5). Thus 7.1 % of the presumed animals were killed between 0-1 year; the percentage strongly increases at 71.4 % during the second year of life. Only 21.4 % of animals were exploited all years long, but nevermore over six years. The age class allotment is also extremely biased towards a greater exploitation of sub-adults. Among the survived animals over three years the young adults are missing, while the mature ones are prevailing. Certainly they were raised for milk production and traction activities. The above mentioned proportion between age classes suggest that the cattle during the Cernavodă I culture were raised chiefly for meat. In the Cernavodă III samples the young: sub-adult: mature ratio is more balanced. 9.3 % of animals were slaughtered before their first winter, 32.5 % before their second winter and 30.2 % in the third year of life. 27.8 % of individuals survived several years (Table 3, Fig. 6), six of them reaching 6-9 years when killed. The killing of animals intensified particularly during autumn/beginning of winter (about one third of presumed animals). Possibly the lack of fodder resources during frosty season might be a trustworthy explanation.

Domestic pig. In the Cernavodă I the pig age profile shows a prevalence of young's (50 %) as the largest component. The sub-adults exemplify a very numerous grouping (44.4 %). By contrast, the adults are very few, about 5.5 %. The slight percentage of individuals within the herd may be explained as a function of sample size. This situation does not match with the greater frequency of species in the faunal spectrum. In Cernavodă III an important part of the immature specimens were killed before or during their first winter, as juveniles (20.8 %). The majority of animals were killed between 1-2 years (62.5 %), as the case of the previous period shows. A small part of the presumed animals were slaughtered not long ago after the eruption and little erosion upon M₃ (16.4 %). No pieces revealed an advanced stage of M₃ wear. Consequently, the age distribution discloses a shift from the predominantly young specimens (50 %) in the Cernavodă I culture to sub-adult ones (62%) in the next period. Without missing in both sites, the pig exploitation is adjusted towards meat and fat production.

Horse. Most of the specimens originate from adult-matures accordingly to the tooth wear phases. The three presumed animals are adult/mature at the site Cernavodă I. More detailed data about age distribution could be made in the other samples. According to the age

class, the distribution of all the specimens contains adults/matures; even a piece of an old mare was identified. Immature animals were not identified. Such an age distribution would have been improbable if they were employed as a meat source. More reasonable their major role would have been as a draught or riding animal traction. Perhaps the horse was eaten occasionally after its usefulness in the community needs. It is worth mentioning that no fragment belonging to meaty regions was entirely preserved.

Red deer. In both phases of the culture, the mandible/maxilla tooth eruption and wear stages exhibit both juvenile/sub-adult and mature animals in similar proportions (50:50 %). No evidence for oldest animals was found. The increased percent of juveniles might be a function of the sample size or an effect of a random hunt.

Wild swine. In the Cernavodă I culture samples all the specimens fell into the young adult group. In the Cernavodă III culture the adults and matures were preferentially hunted. Sub-adult and older animals were not found. According to measurements, most of the recovered bones came from females. In this case the sex ratio is 2: 2 (males: females).

Though both of the samples are utterly modest to be considered statistically reliable, they are of much help for establishing the framework of the economies of the sites and the tendencies of these ones during a culture little investigated from an archaeozoological viewpoint. Exploitation of aquatic resources during the Cernavodă cultures is related to the vicinity of Danube, marking, maybe, a seasonal role to the economic activities. Fishing and gathering were not neglected having some contribution to the inhabitants diet (Fig. 7). Several species of fish frequently living both in the Danube and its flooding plain were identified. Among the remains, the vertebrae of 30-40 mm in diameter suggesting big catfish individuals were found. Remains of carp, pike, were also determined. Snail, shells (*Unio sp.*) are occasionally found, but not in a large number. A shell of *Cardium sp.* was collected from archaeological deposits. Taking into account the inaccurate method of bone collecting, we suppose that aquatic resources would have been much more exploited as the statistics prove it.

The animal husbandry and hunting would be regarded as indispensable segments of the subsistence economy. The caprovines are, by far, the most important group in supplying population with food in both phases. The very high quota seems to be one of the patterns of the animal husbandry during the Cernavodă cultures. Their percentage is submitted to a significant ascendant fluctuation from 34.7 % to 45.1 %. Climatic and ecological conditions seem to have been propitious for their breeding. The cattle frequency rises from 15.2 % to 23.1 % (Fig. 1, 2). By contrary, the pig decreases in frequency down to 6 % during the period. The decline in pig exploitation might show more about an open environment as argued by the higher quota of caprovines. Domestic horse is already a common element during the Cernavodă Cultures. It appears earlier in the Eneolithic deposits (Gumelnița culture): Carcaliu (Haimovici 1996, 379), Bucșani (Băltescu 1998), Căscioarele (Bolomey 1968, 25). All the above mentioned sites yielded values below 5 %.

Wild animals completed domestic protein sources during warmly seasons of the year protecting domestic stocks at the same time. At Cernavodă I the domestic/wild ratio is 79,3/20,4 % (Fig. 3). An important decline of hunting expressed in a 90.8/9.1 % ratio is obviously during Cernavodă III. Red deer are the most common hunted species. They vary from 7.6 % (as MNI) in the first phase, to 3.7 % in the third one. The constant low value of species preferring forested habitat could reflect a reduced density of species due either to disappearance of forested surroundings or an arid climate of the region. Aurochs seem to have a low density during Eneolithic and Transition epochs. They preferred open-forest/forest steppe, existing well in

more arid environments, but never in high number. Aurochs contributed to diet by 3.2 % during Cernavodă I, declining at 1.6 % over time. Just like the red deer, wild swine percentages vacillate between lower values (4-2 %) in both phases. An interesting presence is that of lynx, a characteristic element to dense forested areas. Fox, badger, marten were common elements during prehistoric times; their hunting was occasionally practiced. Some tendencies of the animal exploitation are worth emphasizing on the Cernavodă I sample, as follows:

- a drastic decreasing in cattle breeding retrieved by caprovine and pig ratio augmenting,
- a rising quota of the game,
- a using of domestic stocks especially for meat.

A parallel between the two cultures suggests some changes that would have occurred in the subsistence mode of Cernavodă communities during their evolution:

- a decline in pig exploitation,
- a readjustment of supplied resources on caprovine and cattle exploitation,
- an economy relied upon a more balanced using of domestic mammals, mostly for secondary products,
- a lower quota of hunted mammals.

Unfortunately, a comparison with the former faunal analysis from Cernavodă is irrelevant because of the omission to which culture the sample belongs. Generally, a few common features as the very high domestic and very low wild ratio, the prevalence of caprovines endure. Comparisons with chronologically related settlements are difficult to make, owing to sparse information about animal husbandry during Transition epoch (Table 5, Fig. 7). The study of a sample from Rîmnicelu (Cernavodă I, synchronous with Gumelnița B) (Dumitreșcu, Bolomey, Mogoșanu 1983, 151-153) clearly indicates an increasing of the caprovine rate, though cattle prevail. Horse becomes a more common element. Also, in sites from the Ukraine and Southern Basarabia the small ruminants record 33-39 % and pig is little exploited (Zalkin 1970, 18 apud Haimovici 1996, 38). An analogy with sites of the same epoch (other cultures) emphasizes a different picture (Table 5). So, in the case of Foltești (Haimovici 1979, 13) and Horodiștea (Haimovici 1978, 117) an evidence of cattle (19-23%) prevalence is obvious. In that case, the rate of caprovines is about 12-20 %. Horse and pig have small frequencies, to less than 10 %. A possible explanation of discordances between sites:

Table 2. Age class distribution during Cernavodă I

CAPROVINES		BOVINES		SUIDS	
3 months	1	9-13 m	1	4-7 m	5
3-5 months	2	22-24 m	2	7-8 m	1
5 months	2	24-26 m	4	8-10 m	2
5-7 months	1	28-30 m	1	10-12 m	1
7-9 months	2	30 m	3	16-17 m	3
9-10 months	4	3.5-4 years	1	17-19m	1
10-11 months	4	4-4.5 y	1	21-23 m	2
11-12 months	1	5.5-6.5 y	1	23-25 m	2
21-24 months	6			24-30 m	1
24-32 months	1				
32-36 months	4				
36-42 months	4				
Total MNI	32		14		24

Table 3. Age class distribution during Cernavodă III					
CAPROVINES		BOVINES		SUIDS	
1.2-3 months	1	5-6 m	1	4-5 m	1
4 months	2	6-7 m	1	5-6 m	1
5 months	3	7-9 m	1	9-10 m	2
5-7 months	7	9-13 m	1	12 m	1
7-9 months	6	16-18 m	2	12-14 m	1
9-10 months	4	17-18 m	1	15-16 m	1
10-11 months	7	18-24 m	1	16-17 m	3
11-12 months	2	22-24 m	5	17-19m	1
12-21 months	2	24 m	5	19-21 m	4
21-24 months	16	24-30 m	5	21-23 m	4
2-2,5 years	5	30 m	2	23-25 m	1
2.5-3 years	1	30-31m	2	25-27 m	2
3-3.5 years	11	31-32 m	1	27-29 m	2
3.5-4 years	4	32-33 m	2		
4-4.5 years	10	36 m	1		
4.5-5.5 years	2	40-45 m	1		
5.5-6 years	1	4-4.5 ycars	1		
		4.5-5.5 y	4		
		5.5-6 y	1		
		6-6.5 y	1		
		6.5-7.5 y	2		
		7.5-9 y	2		
Total MNI	84		43		24

Table 4.								
CERNAVODĂ I				CERNAVODĂ III				
%	Young	Sub-adult	Adult	Mature	Young	Sub-adult	Adult	Mature
Caprovines	53,1	21,8	25		38	21,4	7,1	33,3
Bovines	7,1	71,4		21,4	9,3	32,5	30,2	27,8
Suids	50	44,4	5,5		20,8	62,5	16,6	

Table 5. Domestic mammal frequencies in sites of the Transition epoch (MNI)					
"Cernavodă"	Cernavodă I	Cernavodă III	Foltești	Horodiștea	
Bos taurus	21,9	15,2	23,1	20,2	23,8
Ovis/Capra	44,7	34,7	45,1	16,6	20,6
Sus s. domesticus	8,5	19,5	12,9	3,5	9,5
Canis familiaris	7,6	6,5	6,9	1,1	4,7
Equus caballus	2,8	3,2	2,6	9,2	3,1

lies in the different cultural-economic developments and in biogeographical placement either.

Palaeofaunal data argue the existence of various biotopes in the surroundings of Cernavodă. Small ruminants preferred a dry environment, with forested spots. Cattle had similar requirements, with a little more humidity and suids needed well-watered forested areas. Red deer, lynx needed dense forests; wild cattle, roe deer and horse preferred also the forest steppe and open lands. Reiterating these data beside the mammal frequencies it would be supposed that a main part of the area was probably grassy steppe with deciduous forest spots. Maybe dense forests could be found at some distance. Well-watered spots had to exist, considering the site placement in the vicinity of Danube.

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ABBREVIATIONS

Starinar = Srpskkog arheološkog društva.

Hierasus = Anuarul Muzeului Județean Botoșani.

SCIVA = Studii și Cercetări de Istorie Veche și Arheologie.

Peuce = Peuce. Studii și Comunicări de istorie, etnografie și muzeologie.

Measurements - *Ovis/Capra*

Horn core					
Gl	Gd	Sd	Circonf.	O/C	
170	51	41	153	O/Male	Cvd. III
63	26	20		O/Female	Cvd. III
	36	21	92	O/Female	Cvd. III
85	33	21	89	O/Female	Cvd. III
111	34	21	103	C/Female	Cvd. III
135	31	19	94	C/Female	Cvd. III
136	41	24	118	C/Female	Cvd. III
	25	17	70	O/Female	Cvd. I
	45	26	126	C/Female	Cvd. I
120	30	20	81	C/Female	Cvd. I

Mandible				
P2-M3	M1-M3	M3	Age	
65	44	21	3-3,5	Cvd. III
66	46	21	3-3,5	Cvd. III
68	47	24	4-4,5	Cvd. III
68	46	18	3-3,5	Cvd. III
69	46	25	4-4,5	Cvd. III
70	48	24	3,5-4	Cvd. III
70	48	22	2-2,5	Cvd. III
70	50	23,5	2-2,5	Cvd. III
70	50	25	3,5-4	Cvd. III
70	50	26	3-3,5	Cvd. III
70	50	25	4-4,5	Cvd. III
71	50	21	3-3,5	Cvd. III
71	49	22,5	4-4,5	Cvd. III
71	49	22	3-3,5	Cvd. III
71	49	23	2,5-3	Cvd. III
72	49	21,5	3-3,5	Cvd. III
72	49	22	2-2,5	Cvd. III
73	50	25	3-3,5	Cvd. III
73	51	23,5	3,5-4	Cvd. III
74	51	24	3-3,5	Cvd. III
74	50	23		Cvd. III
74	49	21		Cvd. III
74	49	23,5		Cvd. III
76	53	26		Cvd. III
76	52	23		Cvd. III
76	52	22,5		Cvd. III
78	51	24		Cvd. III
78	52,5	23		Cvd. III
	43	29		Cvd. III
	47	24		Cvd. III
	48	25		Cvd. III
	48	24,5		Cvd. III

Axis					
BFcr	SBV	LCDe	H		
44	25	61,5	48,5	O, male	Cvd. III

Scapula				
SLC	GLP	LG		
20,5	37,5	27,5	O	Cvd. III
24	40	34	O	Cvd. III
18	32	23,5	O/C	Cvd. III

Talus			
GLl	GLm	Bd	
29,5	27	18	Cvd. III

Humerus			
Bd	Dd		
26,5	25	O	Cvd. III
29,5	27,5	O	Cvd. III
30,5	27,5	O	Cvd. III
30		Oc	Cvd. III

Tibia			
Bd	Dd		
27	21	Oc	Cvd. III
27	21	Oc	Cvd. III

Maxilla				
P2-M3	M1-M3	M3	Age	Cvd. III
	50	20		Cvd. III
	50	23		Cvd. III
	52	25		Cvd. III
	52	24		Cvd. III
	53	26		Cvd. III
	54	24		Cvd. III
	50	23	2.5-3 y	Cvd. I
	44	23	over 2 y	Cvd. I
75	49	23,5	2.5-3 y	Cvd. I
	43	29	over 2 y	Cvd. I
76	52	22,5	2-2.5 y	Cvd. I
74	51	24	3-3.5 y	Cvd. I
73	51	24	3-3.5 y	Cvd. I
77	51	24	2-2.5 y	Cvd. I
	49	23,5	3-3.5 y	Cvd. I
68	47	23	2.5-3 y	Cvd. I

Calcaneus		
Gl	GB	
59	23	Cvd. III

Metatarsus						
Gl	Bp	Dp	Sd	Bd	Dd	O/C
132	20,5	20	10,5	23	15	O
144	20,5	19,5	11	23	16,5	O

Measurements - *Bos taurus/primigenius* (*)

Horn core						
Gl	Gd	Sd	C	Sex		
/280/	66	53	187	M	Right	Cvd. III
	61	44	169	F?	Left	Cvd. III
/290/	76	56	213	M	Left	Cvd. III
200	54	38	158	F	Left	Cvd. III
320	62,5	48	180	C	Right	Cvd. III
280	61	46	170	C	Right	Cvd. III
	79	57	220	M	Left	Cvd. III
	81,5	58	222	M	Left	Cvd. III
	65	46	179	C?	Left	Cvd. III
	70			M	Left	Cvd. III
248	53	45	160	F	Left	Cvd. III
	85*	65	250	F	Left	Cvd. I
	52	39	158	F	Right	Cvd. I

Mandible				
P2-M3	M1-M3	P2-P4	M3	Cvd. III
	81		35	Cvd. III
			39,5	Cvd. III
	82		35	Cvd. III
	94*		43*	Cvd. III
		53		Cvd. III
	84			Cvd. III
	87		38,5	Cvd. III
			41	Cvd. III
133	90	43	41	Cvd. III
156*	98*	58*	43.5*	Cvd. III
			58*	Cvd. III
			45*	Cvd. III
			41	Cvd. I
			35,5	Cvd. I

Axis		
BFcr	SBV	LCDe
100	60	Cvd. III

Atlas			
BFcr	BFcd	H	GB
101	91	92	146
105		84	
			Cvd. I

Humerus			
BT	Bd	Dd	
72	79	78	Cvd. III
	81	84	Cvd. III
		62	Cvd. I
80	85		Cvd. I
75			Cvd. I

Maxila		
M1-M3	M3	
85	31	Cvd. III
88	32,5	Cvd. III
	29,5	Cvd. III
82	31	Cvd. III
86	31	Cvd. III
	41*	Cvd. III
93*	38*	Cvd. III
81,5	30,5	Cvd. III
	33	Cvd. III
98*	35*	Cvd. III
95*	34	Cvd. I
	33	Cvd. I
88	31	Cvd. I

Scapula			
SLC	GLP	LG	
	71	59	Cvd. III
		53	Cvd. III
		62	Cvd. III
		60	Cvd. III
	71,5	60	Cvd. III
		56,5	Cvd. III
	74	62	Cvd. III
51.5	69	59	Cvd. III
69*	82*	71*	Cvd. I
63	76	61	Cvd. I
61			Cvd. I

Radius				
BFp	Bp	Dp	Bd	Dd
76,5	84	42		Cvd. III
			84**	53,5*
			69**	49
87*	95*	48*		Cvd. I

Metatarsus		
Bd	Dd	
53	30	Cvd. III
54	30	
81*	47*	Cvd. I
53	30,5	Cvd. I

Calcaneus		
GI	GB	
136	52,5	Cvd. III
132	53	Cvd. III
133	52	Cvd. I

Metacarpus					
Gl	Bp	Dp	Sd	Bd	Dd
	59	36			Cvd. III
	63	40			Cvd. III
	63	40,5			Cvd. III
	58	37			Cvd. III
	64	40			Cvd. III
167	48	29	27	51	28
192***	67	40			Cvd. III
				62	33
				80*	43*

Talus			
GLl	GLm	Bd	
69	62	44	Cvd. III
72	65	51	Cvd. III
73	67	51	Cvd. III
75	68	51	Cvd. III
61	55	40	Cvd. III
	65,5		Cvd. III
94*	84*	65.5*	Cvd. III
77*	70*	50*	Cvd. III
87,5*	79*	57*	Cvd. I
68	64	45	Cvd. I
	65,5		Cvd. I

Measurements - *Sus s. domesticus*/* *Sus s. ferrus*

Maxila		
M1-M3	M3	Cvd. III
71	35	Cvd. III
82*	42*	Cvd. III
88*	43*	Cvd. III
	24	Cvd. III
	40*	Cvd. III

Axis		
BFcr	H	
48	58	Cvd. III

Atlas		
BF cr	H	
61	46	Cvd. I

Scapula			
SLC	GLP	LG	
26,5			Cvd. III
23,5			Cvd. III
24	39	36	Cvd. I

Mandible			
P2-P4	M1-M3	M3	Cvd. III
		35	Cvd. III
		35	Cvd. III
	75	37	Cvd. III
	70	38	Cvd. III
	70	35	Cvd. III
		38	Cvd. III
	87*	47*	Cvd. III
38,5			Cvd. III
39			Cvd. III
40			Cvd. III
	78	39	Cvd. I
		44*	Cvd. I
		44,5*	Cvd. I
		43*	Cvd. I
		37	Cvd. I

Humerus		
BT	Bd	
30	36	Cvd. III
34	40	Cvd. I

Measurements - *Canis familiaris*

Mandible							
Total length	Angular L	H mandible	P1-M3	M1	Dahr		
129	130		68	18	Left	153,2	Cvd. III
			73	21	Left	167,7	Cvd. III
116	114	50,5	64,5		Left	143	Cvd. III
			65	20	Left	144,5	Cvd. III
			79	24	Left	185,1	Cvd. III
			59		Right	127,1	Cvd. III
			60		Right	130	Cvd. III
		45			Left		Cvd. III
141,5	141	58,5	74	21	Right	170,6	Cvd. III
			76	21,5	Left	176,4	Cvd. III
			60	18	Right	130	Cvd. III
			66	19	Left	147,4	Cvd. III
				20	Left		Cvd. III
			67	22	Left	150,3	Cvd. III
				20	Left		Cvd. III
133	132	55	70	20	Right	159	Cvd. I
133	132	55	70	20.Ian	Left	159	Cvd. I

Skull					
Total length		161			
Nasion-Prosthion			80		
Facial length			98		
Basal length	150	140			
Staphylion-Palatinoorale			29		
Staphylion-prosthion	81	77,5	83		
Greatest palatal breadth	54	53	58		
Breadth at the canine	35	34	33		
Least breadth of skull	36	36		35	
Euryon-curyon	56	54		54	
Ectorbital-ect.	39,5	44		39	
Greatest height of the orbit		28	29		
Akrocranium-basion	43	40		40	
Greatest breadth of occip	33	33		31	
Otion-otion	61	60		56	
Gr.br.of the occip. condyles		35,5			
Gr.br.of the paraoccip. apof.		44			
Height foramen magnum	17	17,5		14,5	
Breadth foramen magnum	17,5	19		16	
Length of cheektooth	61	57	61		
P4	17.0	19	18		
	Cvd. I	Cvd I	Cvd. III	Cvd. III	

Humerus				
GL	Sd	Bd	Dd	
157	12	23	20,5	Cvd. III

Femurus				
GL	Bp	Sd	Bd	
150	29	10	27	Cvd. III

Measurements - *Equus caballus*

Mandible		
Length of diastema	H mandible in front of P2	
101	67	Cvd. III

Humerus		
Dd	67	Cvd. III

M3 right		
L	B	
22	14	Cvd. I

Radius		
BFp	Bp	
63	70	Cvd. III

Metacarpus								
Gl	Ll	Bp	Dp	Sd	Bd	Dd	I diaph.	
211	201	50 56	32,5	36	46,5	36	Cvd. III Cvd. I	17

Talus		
LmT	BFd	
62	60	Cvd. III

Calcaneus	
GL	
105	Cvd. III

Phalanx I							
GL	BFp	Bp	Dp	SD	BFd	Bd	
87,5	53	59	39	36	43,5	47,5	Cvd. I
Index		67,4		41,1		54,2	
88,5	54,5	61,5	38	37	44,5	49	Cvd. III
Index		69,4		41,8		55,3	

Phalanx II						
GL	BFp	Bp	Dp	SD	Bd	
50	52		34	42		Cvd. III
Index				84		
47	51,5		34	42	52,5	Cvd. I
Index				89,3	111,7	

Phalanx III						
GL	GB	BF	LF	Ld	HP	Cvd. I
	88	56,5				Cvd. I
	85	53	29	54		Cvd. I
		57				Cvd. I
		52	26,5	52		Cvd. I
		47,5		52		Cvd. III
						Cvd. III
67	85	50	26	55	40	Cvd. III
70	83,5	46	25,5	61	43	Cvd. III
76	89	49,5				Cvd. III
Average	86,1	51,44	26,75	54,8		

Measurements - *Cervus elaphus*

Maxilla		
P2-P4	52	Cvd. I

Mandible		
P2-P4	57	Cvd. I

Scapula			
SLC	GLP	LG	
36	61	48	Cvd. I
38		46	Cvd. I

Tibia		
Bd	Dd	
53	42	Cvd. I
55	41	Cvd. I

Metacarpus		
Bd	Dd	
45,5	31,5	Cvd. III

Calcaneus		
GL		
121	43,5	Cvd. III
121	43	Cvd. I

Roe deer

Mandible			
P2-M3	M1-M3	M3	
66	39	16,5	Cvd. I

Humerus		
Bd	Dd	
26	24	Cvd. III
27	25,5	Cvd. I

Lynx lynx

Mandible		
Total length	Condilar length	Teeth length
106	105,5	40

Ulna	
GL	
115	Cvd. I
136	Cvd.I

Vulpes v.

Mandible			
Total length	Condilar length	Teeth lg.	M1
101	101.5	55	17,5

Meles m.

Mandible		
Teeth lg. M1		
41	16	Cvd. I

Martes m.

Mandible			
M1-M2	P1-P4	M1	
13,5	18	10	Cvd. III

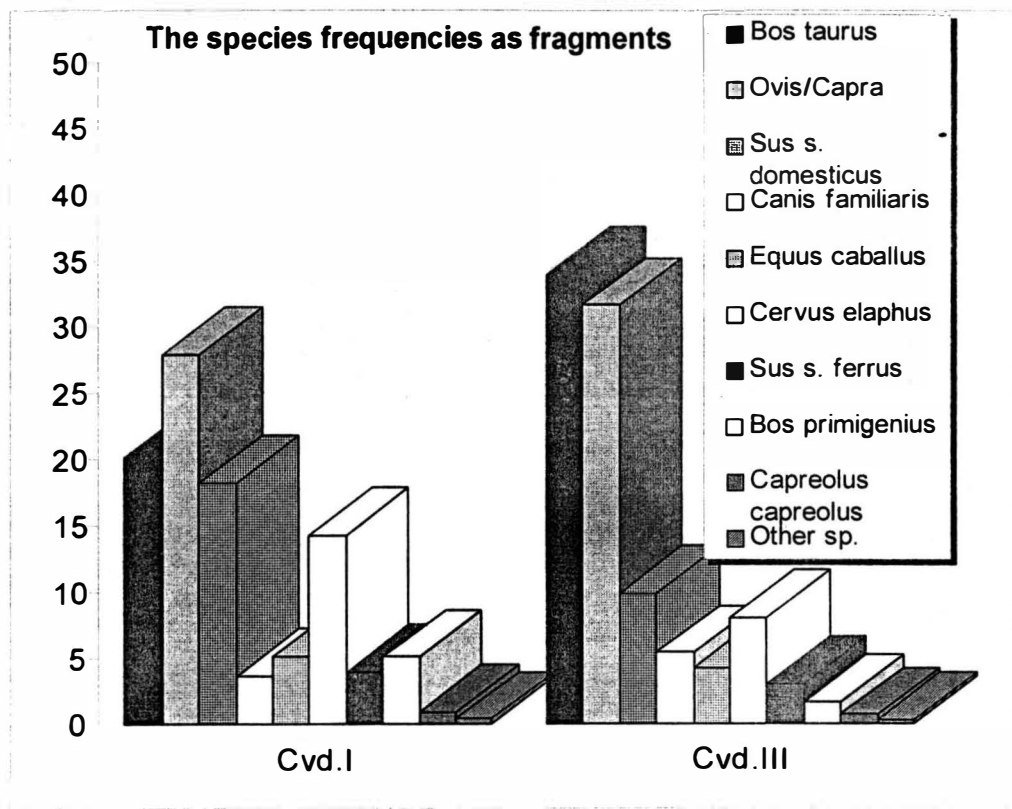


Fig. 1

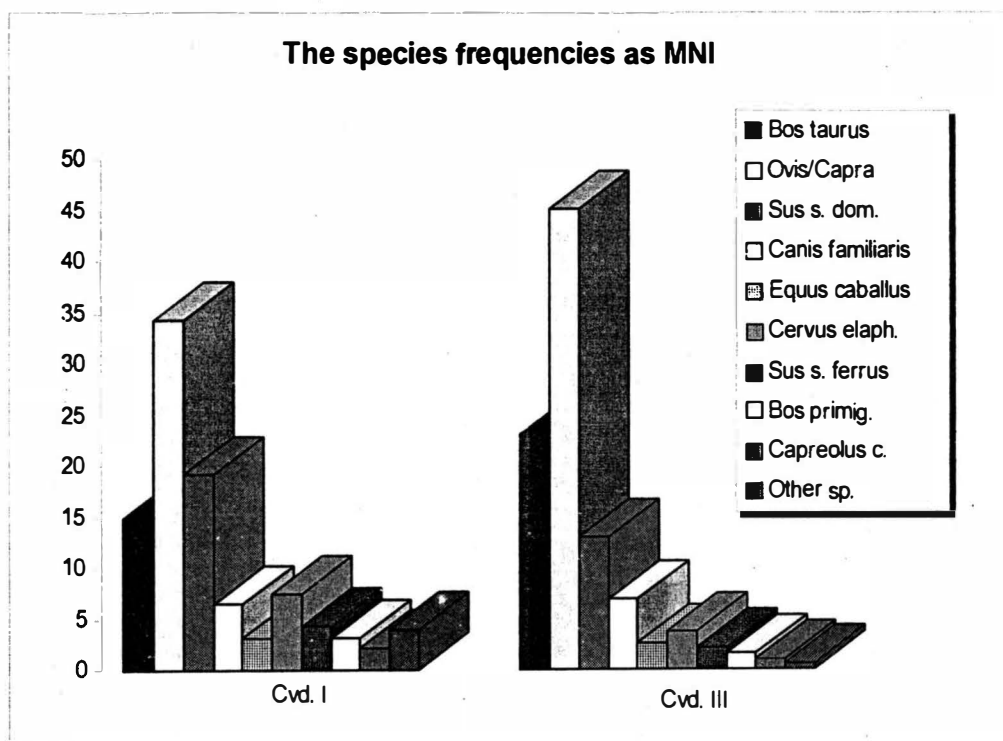


Fig. 2

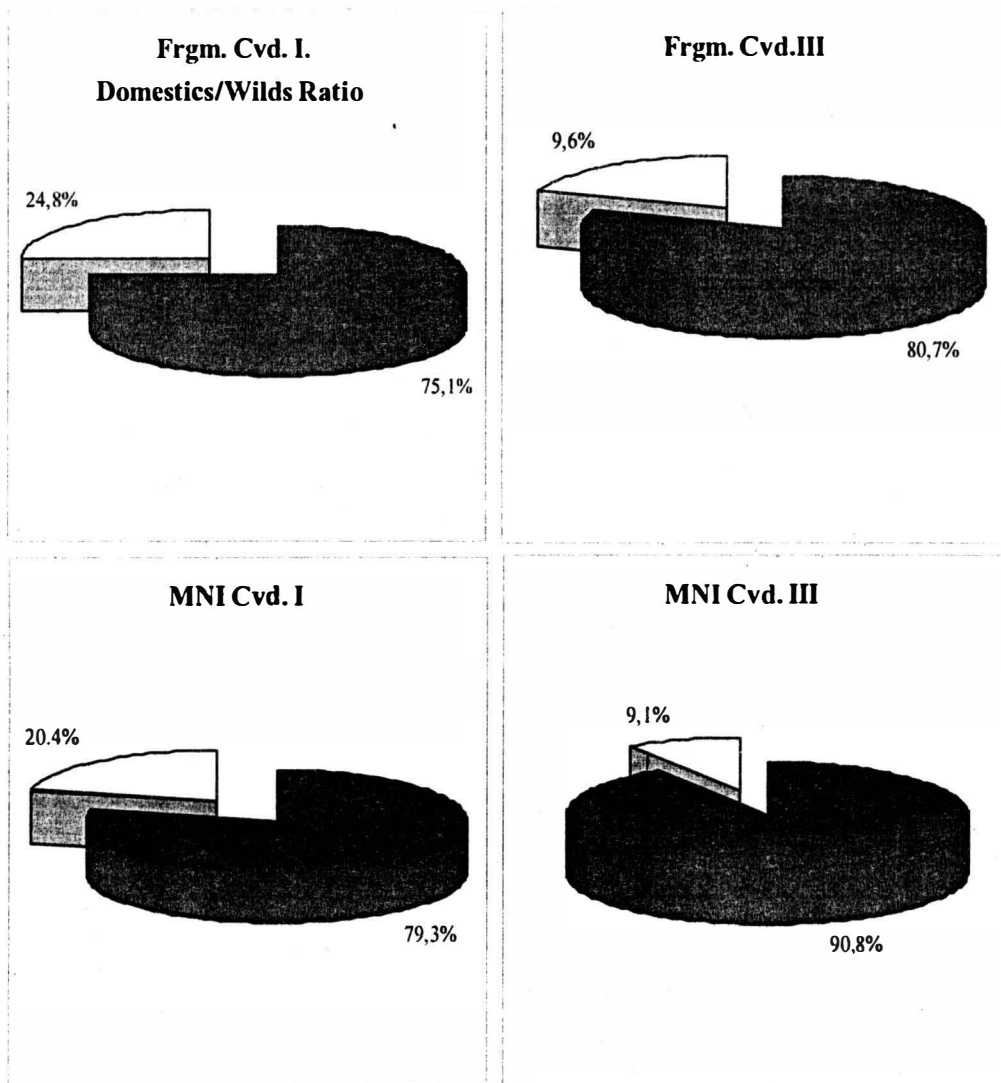


Fig. 3

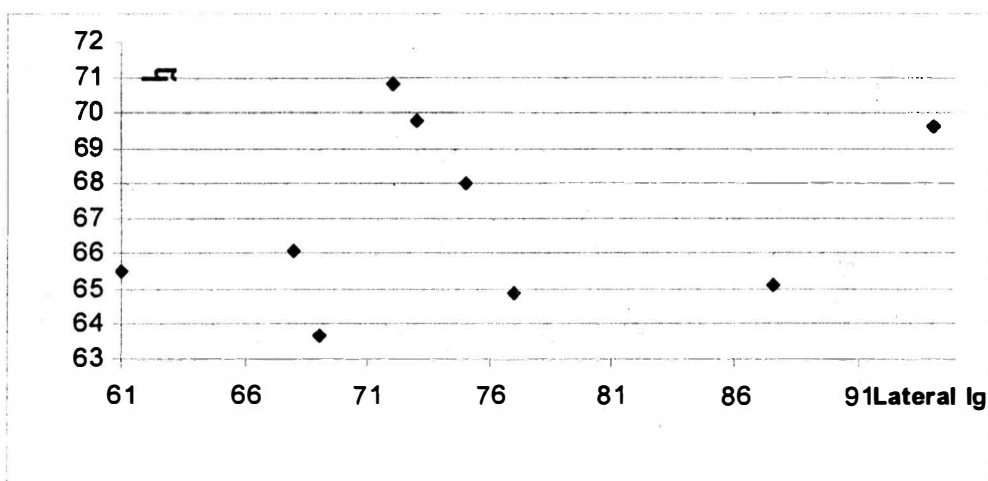


Fig. 4

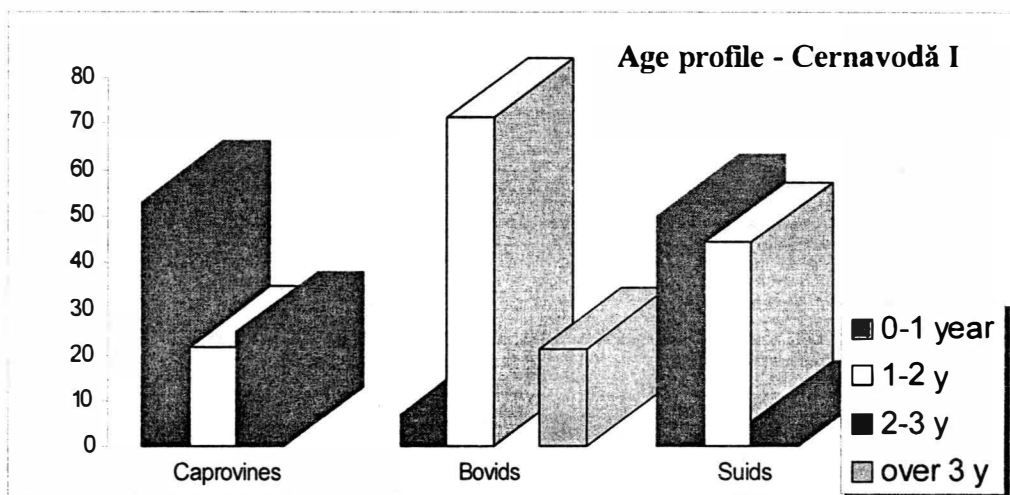


Fig. 5

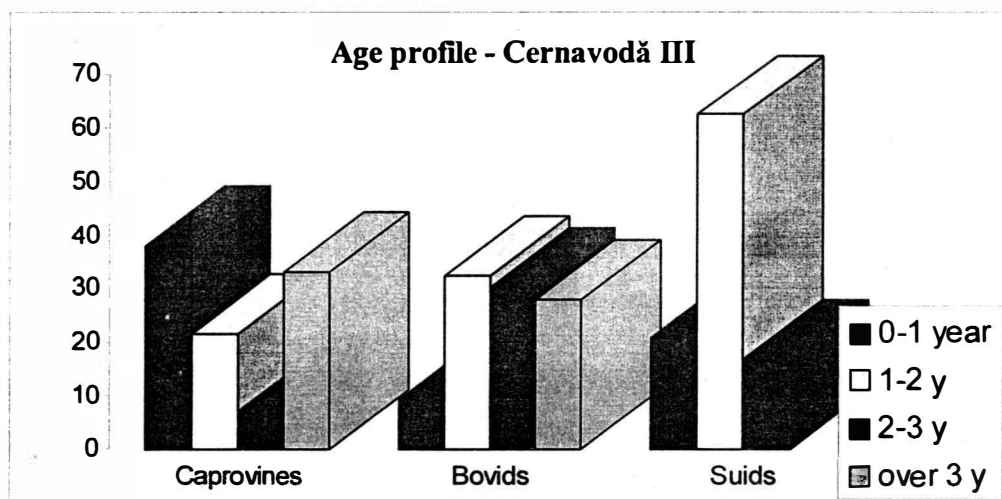


Fig. 6

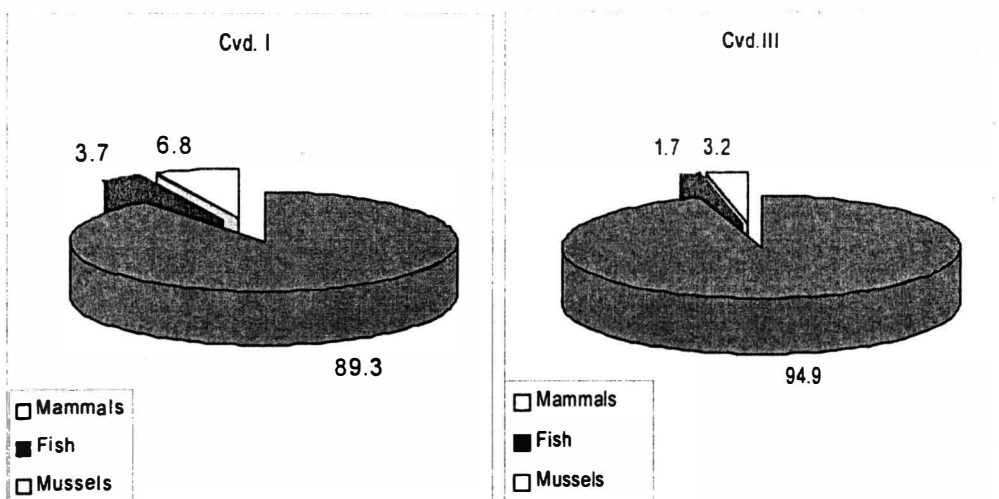


Fig. 7

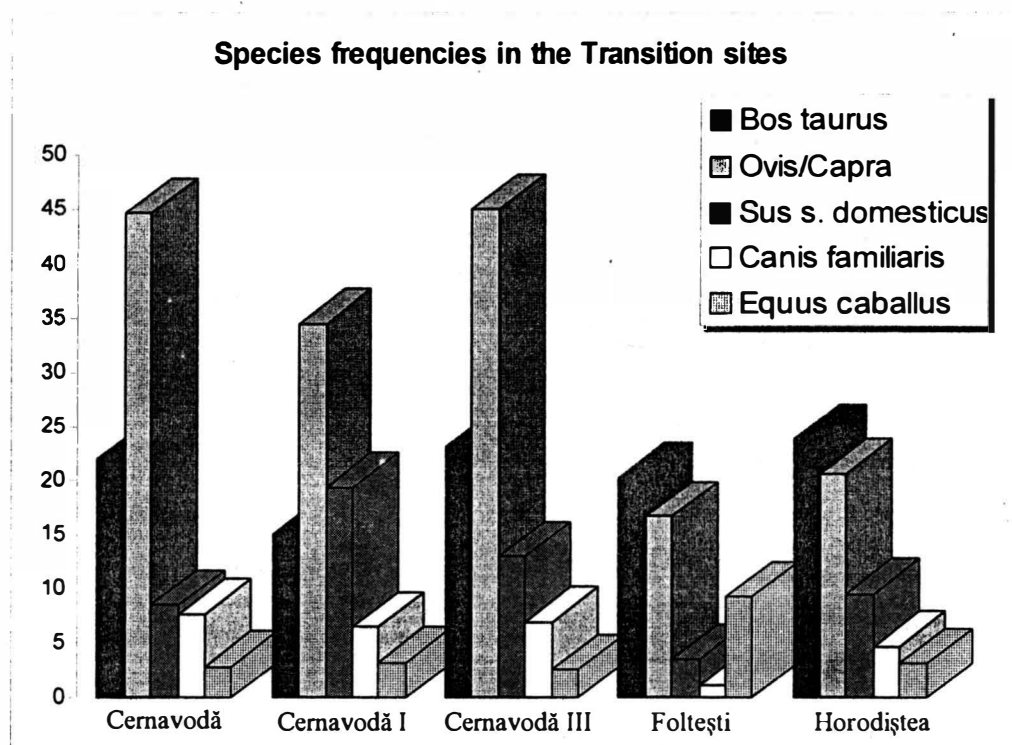


Fig. 8