# Bronze Age Fauna from Pianu de Jos-*Lunca Pârâului* (Wietenberg culture)

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***Abstract:*** *The analysis of the fauna from Pianu de Jos-Lunca Pârâului reveals that livestock farming played an important role for the Wietenberg community here. Therefore, cattle are the most numerous, irrespective of how we quantify them (NR, MNI and W). They were exploited mainly for meat, milk and its derivates but also for traction. Suides and caprines share the second place. While pigs were raised exclusively for meat, fat, etc., the sheep and goats were exploited in a mixed manner, both for meat and milk and its derivatives. The horse, although it shows a small percentage, was used for mobility, its workforce (traction) and it was also consumed in terms of food. Hunting also shows a small percentage, its importance is extremely low given the number ostheological remains and species (only 4). A comparison with other Wietenberg sites (Derșida and Cauce Cave) which have benefited of archaeozoology studies on relatively large assemblages – over 450 specifically determined ostheological remains – shows an extraordinarily diverse situation that does not allow us at this stage of research to portray this culture in a more pertinent way. The hard animal material industry of the Pianu de Jos-Lunca Pârâului settlement includes a total of 10 items, the majority being finite products: pointed and bevelled tools, skate etc. The blanks come especially from domestic species (*Bos taurus *and* Ovis aries/Capra hircus*); the only wild species is the red deer (*Cervus elaphus*), from which the antlers were used. Despite the limited assemblage, we identified some of the daily living activities from the Pianu de Jos community, especially domestic activities (skin processing) and less of hunt.*

***Rezumat:*** *Studiul faunei de la Pianu de Jos-Lunca Pârâului ne relevă că activitatea de creștere a animalelor deținea un rol important în viața comunității Wietenberg de aici. Astfel, bovinele sunt cele mai numeroase indiferent de modul de cuantificare al lor (număr de resturi, număr minim de indivizi și greutate), ele fiind exploatate mai ales pentru carne și secundar pentru lapte și forța lor de tracțiune. Porcinele și ovicaprinele își dispută locul doi. Dacă primele sunt crescute preponderent pentru producția de carne, grăsime etc., cornutele mici sunt exploatate de o manieră mixtă, atât pentru carne cât și pentru lapte și derivatele sale. Calul, deși are o pondere redusă, pe lângă utilizarea sa ca mijloc de locomoție, forța sa de muncă (tracțiune) era și consumat din punct de vedere alimentar. Vânătoarea are o pondere redusă, importanța sa fiind extrem de mică având în vedere numărul limitat de resturi și specii (doar 4). O comparație cu alte situri Wietenberg (Derșida și Peștera Cauce) care prezintă studii de arheozoologie și eșantioane relativ mari de peste 450 resturi determinate specific ne arată situații extrem de diverse, care nu ne permit în acest stadiu al cercetării să caracterizăm de o manieră mai pertinentă această cultură. Industria materiilor dure animale din așezarea de la Pianu de Jos-Lunca Pârâului include un total de 10 piese, majoritatea fiind produse finite: vârfuri și dăltițe, patină etc. Suporturile provin în special de la specii domestice (*Bos taurus *și* Ovis aries/Capra hircus*); singura specie sălbatică este cerbul (*Cervus elaphus*), de la care s-au folosit coarnele. În ciuda ansamblului limitat, noi am identificat câteva dintre activitățile zilnice ale comunității de la Pianu de Jos, fiind vorba în special despre activități domestice (prelucrarea pieilor) și mai puțin de vânătoare.*

***Keywords:*** *archaeozoology, Bronze Age, Wietenberg culture, hard animal materials industry.*

***Cuvinte cheie:*** *arheozoologie, epoca bronzului, cultura Wietenberg, industria materiilor dure animale.*

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## ◈ Introduction

The Middle Bronze Age site Pianu de Jos-*Lunca Pârâului* (P. Damian *et alii* 2013a) was discovered in 2012 on the occasion of the preventive archaeological campaign organized in view of the construction of a motorway, part of the Pan-European Corridor IV (A1 Highway Orăștie - Sibiu, section 1 Orăștie - Sebeș). The site is situated approximately 600 m south of Sibișeni village, its eastern limit being the Pianu Creek (tributary of the Mureș River, about 3 km distance in a straight line). As for the administrative location, the site is part of the Pianu de Jos village, Pianu commune (Alba County, Romania) (fig. 1).

The area measuring 2.5 hectares was analyzed by a team composed of archaeologists P. Damian, I. Bocan, D. Vleja, M. Voicu, C. Cristescu and C.D. Țuțuianu. The preventive archaeological excavation has documented the existence of both habitation (two surface dwellings, fireplaces, outdoor platforms made of river stones and pits) and funerary features (cremation and inhumation graves). Although a short description of the site was published in the form of an interim report (P. Damian *et alii* 2013a), unforeseen circumstances have delayed publication of an extensive excavation paper.

This analysis focuses on the faunal assemblage associated with Wietenberg material. The osteological remains were discovered in 57 pits of various sizes and two dwellings. Animal bones were collected manually during the excavation. It is likely however that smaller bone fragments were omitted, since sieving was not possible.

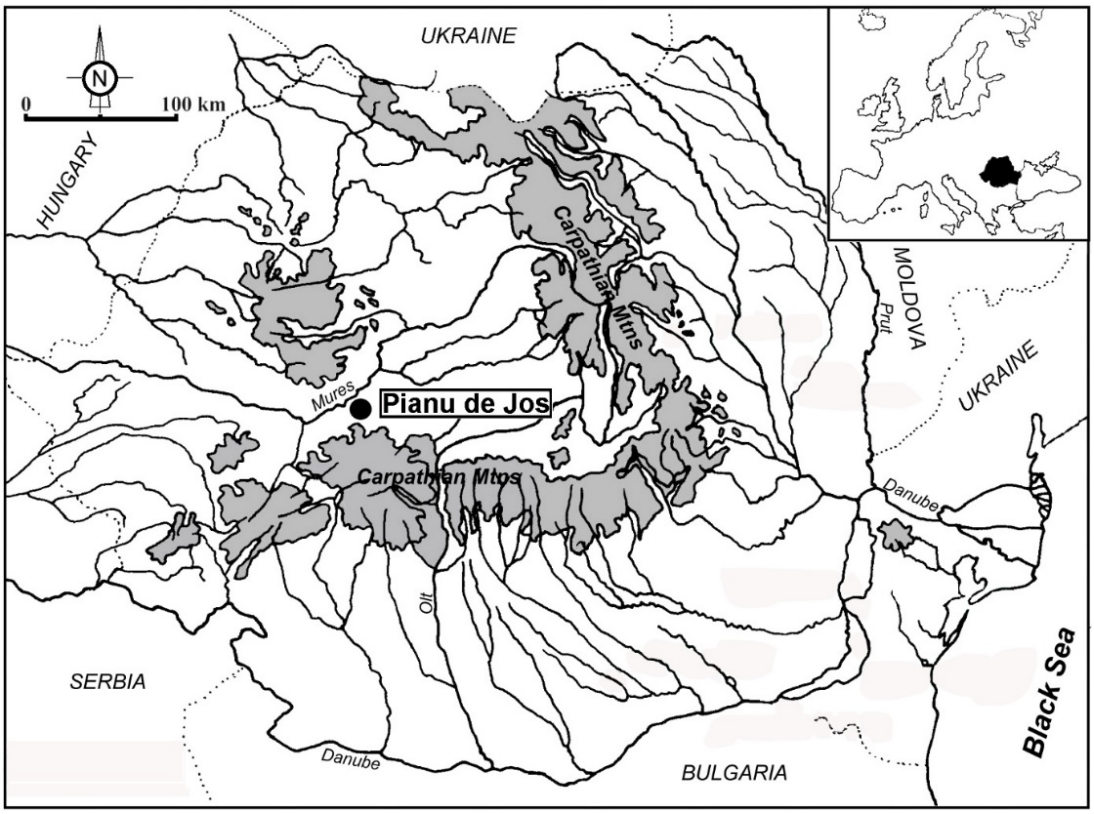


**Fig. 1.** The position of the Pianu de Jos-*Lunca Pârâului* site.
Localizarea sitului de la Pianu de Jos-*Lunca Pârâului.*

## ◈ Archaeological data. Layers and features

The overall stratigraphic sequence[1] is rather simple (P. Damian *et alii*, 2013b). The site at Pianu de Jos-*Lunca Pârâului* lies upon the left terrace of the Pianu Creek, which is an area containing brown earths and sandy soils. The sequence containing Bronze Age material (layer no. 3), was the oldest, and was sitting right on top of the archaeologically sterile, yellow, clayey sand. It had a width of maximum 55 cm, and was generally situated between -1.10 and -0.55 m from the surface. The Bronze Age sequence is a well formed, compact, homogenous deposit of clayish silt of grey or dark brown colour, with a granular structure and frequent anthropogenic constituents. Only on some small areas, a thin layer (layer no. 4) of lighter brown colour, containing pebbles – but otherwise similar to layer no. 3 – was recorded. Its position corresponded to the lower part of the Bronze Age sequence, and it contained Eneolithic or Early Bronze Age material. The next stratigraphic layer (no. 2), directly following the Bronze Age level is a habitation layer dating the Middle Ages (12$^{th}$ century). Occasionally, it also included Roman period material. The Middle Ages sequence was 20 to 25 cm in width, and was generally situated between -0.55 and -0.30 m from the surface. It was a compact, homogenous deposit of clayish silt and fine sand of dark grey colour. The last layer, the closest to the surface, comprised a 30 cm, thick, vegetal soil, used for agriculture. Several features of the site need mentioning, a modern irrigation channel which crosses the site right in its middle and the past course of the Pianu river – as shown on the Josephinian Land Survey in 1769 – which cuts through the site as well.

The majority of the Wietenberg (III$^{rd}$ phase, after Rotea 1998, p. 129) domestic features that were excavated – 136 out of a total of 259 – consist of pits, two surface dwellings, one outdoor hearth and one platform made of river stones (fig. 2). The funerary features do not make the subject of this article as the faunal remains discovered within, as well as those from the Bronze Age layers will be analysed separately and published in the near future.

The small pits have a diameter between 50 and 199 cm, while the 19 larger ones go up to 380 cm. They range between 30 and 130 centimetres in depth. The shapes vary, most of them being circular or oval, rarely irregular, with vertical or oblique walls. Some other times, they exhibit a "bell" shape cross section and a concave, flat, or irregular base. It is not clear what the original function of the large pits was, but it is unlikely that they functioned as simple refuse pits, since they contain whole vessels and high quality pottery, along with a considerable amount of ceramic material. Although there is not enough evidence for interpreting them as habitation structures, for some of them this possibility should not be excluded.

The two surface dwellings (C21-House 1 and C143-House 2) appeared at first as large masses of burnt clay. They were both of rectangular shape, oriented on West-East axis, with the hearths placed in the North-East corners. Both dwellings were built directly on the ground, judgement made on the basis of the absence of any floor arrangement. It is very likely that the House 1 was elevated on a wooden support as there were no traces of postholes. This is not the case for House 2, which had a lineup of four postholes on its southern side. The fills of the postholes contained charcoal and burnt clay pigments. These two structures can be ascribed to the *b3* house type within the typology established by M. Rotea (M. Rotea 1998, p. 28).

[1] The geological description of the stratigraphic layers was made by Dr. Constantin Haită (National Museum of Romania History).

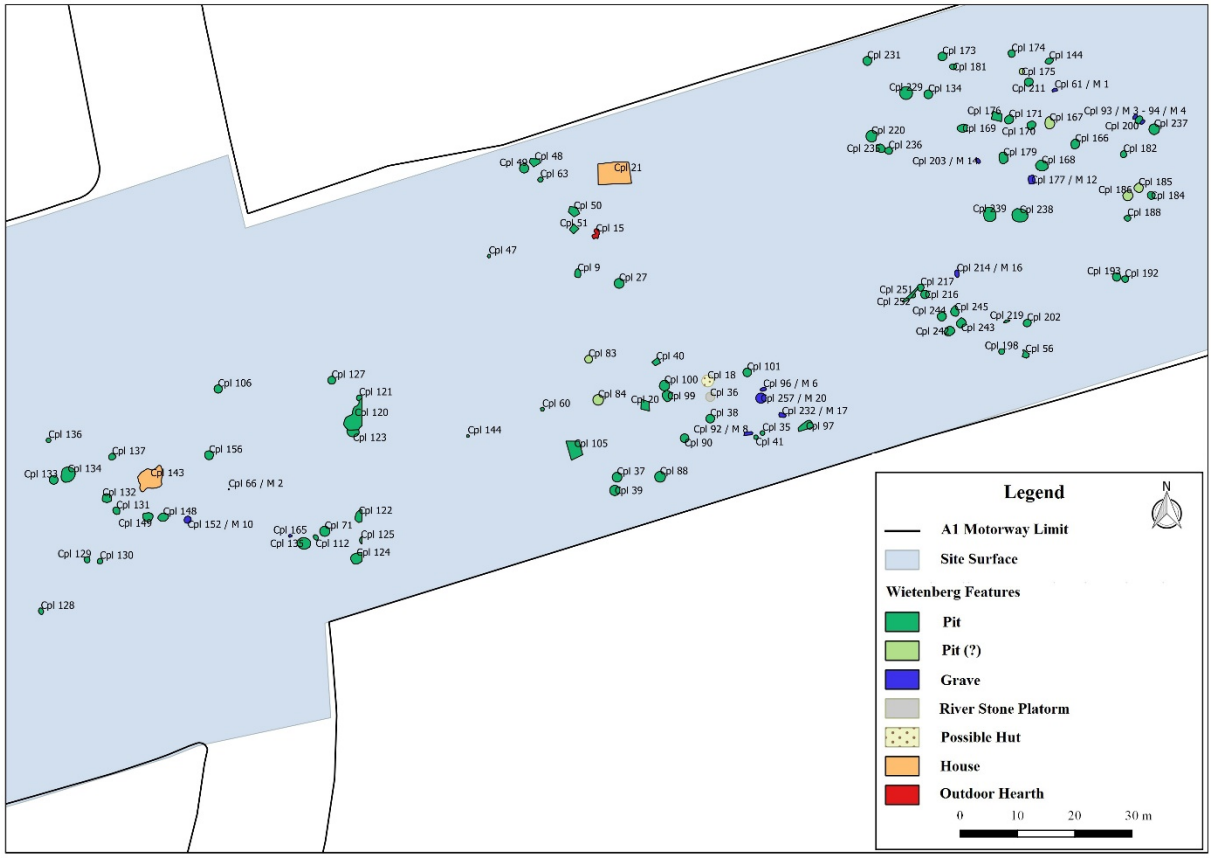


**Fig 2.** Plan of the Wietenberg features.
Planul complexelor Wietenberg.

### ◈ The assemblage

The importance of the present analysis is strengthened by the scarcity of archaeozoological studies concerning the Wietenberg culture (A. Bălăşescu *et alii* 2004). The opportunity to conduct preventive excavations occasioned by the construction of the A1 motorway gave us the chance to study a complete faunal assemblage, which has proved to be extremely interesting. Implicitly, its integrity allowed us to better understand several aspects of the Wietenberg communities, relatively little known in the wider context of the Bronze Age. As we already stated, the number of published archaeozoological studies is extremely low. There are two rather large assemblages, those from Cauce Cave – with 739 faunal remains of which only 472 were specifically determined (S.A. Luca *et alii* 2005) – and those from Derşida *Dealul lui Balotă* – 1695 faunal remains of which 1127 were specifically determined (D. Bindea 2008). Two very small batches can be added: Mintiu Gherlei – just 47 fragments of which 43 were determined – and Boiu with 23 determined faunal remains (D. Bindea 2008). Since this study focuses on faunal remains with a clear domestic provenance, the assemblages from Oarța de Sus and Mereni (D. Bindea 2008, p. 94) were not taken into account.

All the faunal material analyzed here came exclusively from domestic features within the Pianu de Jos-*Lunca Pârâului* settlement. The majority of these features are pits (57), along with two surface dwellings (C21 and C143). In terms of chronology, based on ceramic characteristics they can be dated in the III$^{rd}$ phase of the Wietenberg culture. At the outset of this study we have to specify that we exclusively considered those well dated archaeological

features, while those structures that lacked a clear chronological framework and presented a mixture of material from different historical periods were excluded.

We also have to mention that the animal bones were collected manually during the excavation – which presents a number of advantages as well as disadvantages (Popovici *et alii* 2002, p. 57-58). However, all things considered – the time factor, the season, and especially the nature of the excavation – this method of sampling is preferred, although for a better understanding of the entire faunal assemblage the sieving of at least 10% of the features volume is necessary.

The faunal remains add up 1,262 fragments weighing 18.254 kilograms. Of these, 518 were determined in terms of taxonomy (41.04%) having a weight of 13.608 kg (74.54%). Given that a relatively small number (10) of hard animal materials was discovered within the assemblage we decided to introduce them as part of this present study.

The amount of faunal material from each archaeological feature is highly variable. Thus some are relatively abundant, with over 100 osteological remains – such as C20 (197 of which 84 were specifically determined), C105 (143 total no./55 determined), C40 (128 total no./60 determined), C35 (102 total no./40 determined). The list of those features containing under 5 faunal remains is very long: C34, C37, C81, C100, C101, C106, C124, C131, C132, C142, C149, C154 , C157, C181, C198, C209, C217, C229, C230, C231, C238, C243, C245 (annex 1).

The average weight of an animal bone in this assemblage is 14.4 g, while that of a specifically determined bone is 26.3g. For a medium sized specimens, the weight of an indeterminable bone is 2.9 g, while for a large sized one is 8.3 g.

The fauna shows all the typical attributes of household debris: an intensified fragmentation reflected also through the specific determination degree, cutting marks (7%), burned marks (2.5%) and traces of gnawing probably caused by carnivores – mainly dog, but it should not be underestimated the destructive action of the pig.

## ◈ Archaeozoological methodology

The very rich fauna, which counts more than 1,260 osteological remains, belongs entirely to mammals. Anatomical and taxonomic determinations were carried out during the year of 2016 at the Laboratory of Archaeozoology / National Center for Pluridisciplinary Research, at the National History Museum of Romania. As for the main methodological guidance, we considered the works of R. Barone (1986) and E. Schmid (1972). The distinction between sheep and goat was made based on the post-cranial skeletons characteristics following the criteria established by J. Boesneck *et alii* (1964), and tested by J. Clutton-Brock *et alii* (1990) and W. Prummel and H.J. Frisch (1986). Regarding the dental remains, we referred to the papers of S. Payne (1985), D. Helmer (2000) and P. Halstead *et alii* (2003).

The butcher age was estimated by dental eruption following the work of E. Schmid (1972), and for dental attrition we made use of the works of P. Ducos (1968) and A. Grant (1982) for cattle, S. Payne (1973) and D. Helmer (2000) for sheep and goat, and M.-P. Horard-Herbin (1997) for suids. For horses we used R.S. Huidekoper (1891). The correlation of biological and zootechnical data was carried out after V. Forest (1997).

Measurements of faunistic remains were made with calipers of 1/10mm instrumental precision. The measurements followed the recommendations of A. von den Driesch (1976) and are specified in the biometrics data annex (annex 2).

### ◈ Description of the faunal material

The taxa list is relatively short. It comprises only nine species, five of which are domestic: cattle (*Bos taurus*), sheep (*Ovis aries*), pig (*Sus domesticus*), dog (*Canis familiaris*), horse (*Equus caballus*), and four are wild: aurochs (*Bos primigenius*), red deer (*Cervus elaphus*), wild boar (*Sus scrofa*) and hare (*Lepus europaeus*) (tab. 1, fig. 3, annex 3 and pl. 1-3). Within the caprines group (*Ovis aries*/*Capra hircus*) we did not identify exactly any goat bone, but it is likely that this species existed within the assemblage.

The quantification of the fauna was achieved both as number of osteological remains (NR) and weight (W), as well as the minimum number of individuals (MNI). Considering the large number of archaeological features investigated at Pianu de Jos-*Lunca Pârâului*, to avoid overrepresentation of NMI, we estimated this number for the overall settlement. Regardless of the quantification methods we observed that the domestic mammals dominate (98.46% NR; 98.66% W; 87.88% MNI). This fact suggests that livestock played an important role for this community.

As number of osteological remains, we notice that domestic cattle are the most numerous (57.53%) being followed by caprines (20.85%) and pigs (11.97%). Along with these species we have also identified horse (5.6%) and dog (2.51%) bones, which share much lower percentages compared to other taxa.

In terms of weight, cattle maintain their supremacy (75.07%), followed this time by pigs (9.37%), horses (7.36%), and sheep and goats (6.29%). This turnaround in livestock paleoeconomy regarding the second and third places is due to the fact that the specific weight of pigs and horses is much higher compared to that of caprines, considered to be medium-sized animals. The MNI evaluation also shows that cattle have the highest share (36.36%), which is backed equally by caprines and pigs (18.18%). The horse (9.09%) and dog (6.06%) had a lower importance.

| **Specie** | **NR** | **%** | **W** | **%** | **MNI** | **%** |
|---|---|---|---|---|---|---|
| *Bos taurus (cattle)* | 298 | 57.53 | 10216 | 75.07 | 12 | 36.36 |
| *Ovis aries (sheep)* | 7 | 1.54 | 99 | 0.73 | 1 | 3.03 |
| *Ovis aries/Capra hircus (sheep/goat)* | 101 | 19.31 | 757 | 5.56 | 5 | 15.15 |
| *Sus domesticus (pig)* | 62 | 11.97 | 1275 | 9.37 | 6 | 18.18 |
| *Canis familiaris (dog)* | 13 | 2.51 | 77 | 0.57 | 2 | 6.06 |
| *Equus caballus (horse)* | 29 | 5.60 | 1002 | 7.36 | 3 | 9.09 |
| *Sus scrofa (wild boar)* | 2 | 0.39 | 60 | 0.44 | 1 | 3.03 |
| *Bos primigenius (aurochs)* | 1 | 0.19 | 15 | 0.11 | 1 | 3.03 |
| *Cervus elaphus (red deer)* | 3 | 0.58 | 100 | 0.73 | 1 | 3.03 |
| *Lepus europaeus (hare)* | 2 | 0.39 | 7 | 0.05 | 1 | 3.03 |
| **Total mammals identified** | **518** | **100** | **13608** | **100** | **33** | **100** |
| large mammals unidentified | 435 | | 3612 | | | |
| medium mammals unidentified | 303 | | 883 | | | |
| **Total mammals identified** | **1256** | | **18103** | | | |
| *Cervus elaphus* - antlers | 6 | | 151 | | | |
| **Total mammals** | **1262** | | **18254** | | | |

**Tab. 1.** The animal osteological remains distribution by number (NR), weight (W), and minimum number of individuals (MNI) at Pianu de Jos-*Lunca Pârâului*.
Repartiția resturilor faunistice ca număr de resturi (NR), greutate (G) și număr minim de indivizi (NMI) la Pianu de Jos-*Lunca Pârâului*.

Regarding the hunting activity, we can assume that it did not play an important role if we consider the NR (1.54%) and W (1.34%), but its share appears to be greater as MNI (12.12%).

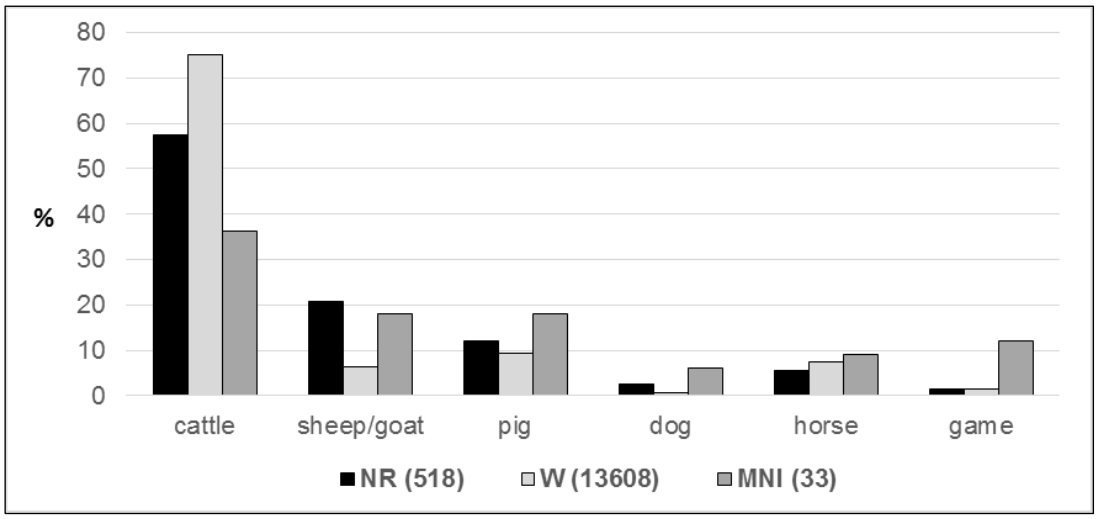


**Fig. 3.** Percentage distribution by number of osteological remains (NR), weight (W), and minimum number of individuals (MNI) at Pianu de Jos-*Lunca Pârâului*.
Distribuția procentuală ca număr de resturi (NR), greutate (G) și număr minim de indivizi (NMI) la Pianu de Jos-*Lunca Pârâului*.

### ◈ Exploitation of domestic animals

The butcher age of livestock shows mainly the reasons for which they are bred and exploited. For the domestic animals, the butcher ages were estimated based only on dentition, according to the methodology described above.

Cattle (*Bos taurus*) which are the most numerous in terms of the MNI presented the following ages: an individual of 6-12 months, two individuals of 1-2 years, three of 2.5-3 years, two of 3-4 years, two of 4-6.5 years, one of 6.5 to 9 years and only one aged more than 9 years. These ages suggest a mixed exploitation of animals, primarily for meat production – documented by the relatively large number of young animals, aged between 1 and 4 years – 58.3%) – but also for their secondary products milk and its derivatives (33%), as well as for traction – shown by the presence of the individual aged more than 9. The sex determination was made impossible because of the absence of any horn-core processes doubled by the high degree of bone fragmentation.

For the caprines group (*Ovis aries*/*Capra hircus*) the following butcher ages have been observed: two individuals of 6-12 months, one of 12-24, two of 2-4 years (of which one is a sheep) and one of 4-6 years. These ages show that both species were bred for meat production (young animals between 6 and 24 months – 50%), as well as for milk and wool (individuals over 2 years – 50%).

Pigs (*Sus domesticus*) were the only animals raised exclusively for meat production, fat, etc. Their butcher ages were as follows: an individual of 8-10 months, an individual of 16-18 months, one of 18-20 months, one of 20-24 months, one of 3 years and one of 3-5 years. As the statistics show, the majority (83.3%) of the individuals were butchered after they reached 16 months. This indicates the gain of an optimal weight, therefore a high (increased) butchering

efficiency. Two of the individuals were older – around and over 3 years – implying their function for breeding.

Although they are represented by a small number of osteological remains – only 29 – as NMI we have identified three horses (*Equs caballus*) with the following butcher ages: one of 18-24 months, one of 3-4 years and one of 10-14 years. Four bone fragments (a radius, a coxal bone, a metapod and a phalanx 1) presented cutting and burning marks. These details help to demonstrate that the horse was consumed by the Wietenberg communities inhabiting the Pianu de Jos-*Lunca Pârâului* settlement.

The presence of the dog (*Canis fammiliaris*) is illustrated only by two individuals: one of 5-6 months and another one over 1 year of age.

Hunting is represented only by adult individuals for each wild taxon discovered at Pianu de Jos-*Lunca Pârâului* (aurochs, red deer, wild boar and hare).

### ◈ Comparison with other Wietenberg sites

The animal paleoeconomy is little known for the Wieteneberg communities if we consider the extremely limited number of studies conducted to date. As we have previously shown, only two – Derșida (D. Bindea 2008) and Cauce Cave (S.A. Luca *et alii* 2005) – of the four sites that benefited of an archaeozoological study have rich enough assemblages to allow us a series of comparisons for a better understanding of the subject. We have to specify that the Cauce Cave is in fact a seasonal settlement connected to the exploitation of certain resources in the area during spring and autumn (G. El Susi 2005, p. 119).

For the reason that all these assemblages are dominated by the presence of mammals in what follows we will refer only to them.

The domestic animals prevail in these settlements, both as NR and MNI. Regarding the weight of the main domestic taxa, we can observe that for Pianu de Jos and Derşida sites, the cattle are dominant (57.5% and 35.8%), followed by caprines (28.8% and 29.1%) and suids (11.9% and 27.7%), while for the Cauce Cave, the caprines have the largest share (40.7%), backed by pigs (29.2%) and lastly by cattle (8.7%) (fig. 4).

Concerning the MNI, the situation is more complicated. If for the Pianu de Jos settlement, cattle are the most numerous, followed almost equally by the caprines and pigs; the differences between major species at Derșida run of just three percent (caprines – 28.7%, cattle – 26.1%, pigs 25.5%) which would suggest a relative equality as a share; for the Cauce Cave pigs (32.3%) exceed caprines by three percent (29.2%), followed at great distance by cattle (fig. 5).

The importance of other domestic taxa is reduced as NR and NMI and that is why we will not insist any further.

Hunting does not seem to have played a very important role in the paleoeconomy of the settlements at Pianu de Jos-*Lunca Pârâului* and Derșida (below 4% as NR and about 10% as MNI), while for the Cauce Cave it is relatively well represented as NR (17.2%) and MNI (23.1%).

As shown in this comparative analysis of the three sites, the situations are extremely diverse, especially in relation to the exploitation of different taxa. This seems to be influenced by the geographical environment, experience of these communities, etc.

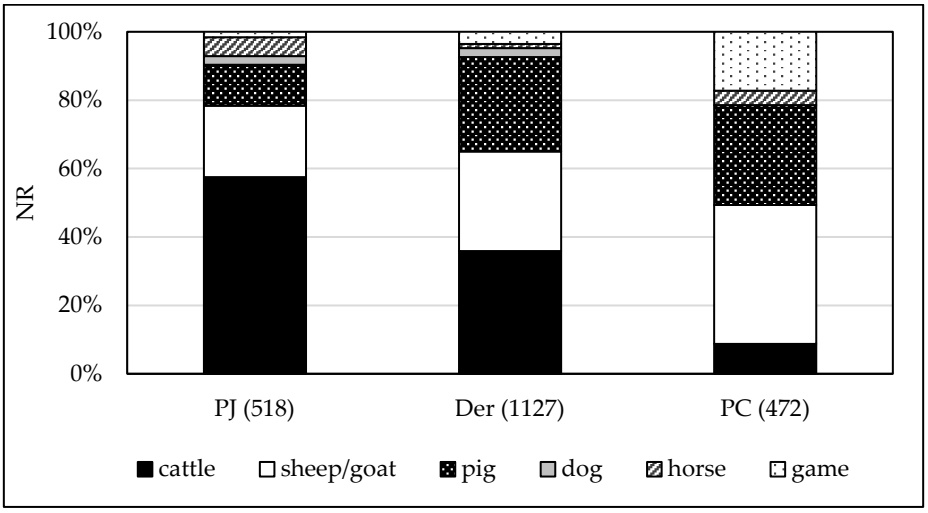


**Fig. 4.** Percentage distribution of faunal remains in different Wietenberg sites (between brackets is the number of specifically determined bones). Legend: PJ – Pianu de Jos; Der – Derșida; PC – Cauce Cave.
Distribuția procentuală a resturilor faunistice în diferite situri Wietenberg (în paranteză se găsește numărul de fragmente determinate). Legendă: PJ – Pianu de Jos; Der – Derșida; PC – Peștera Cauce.

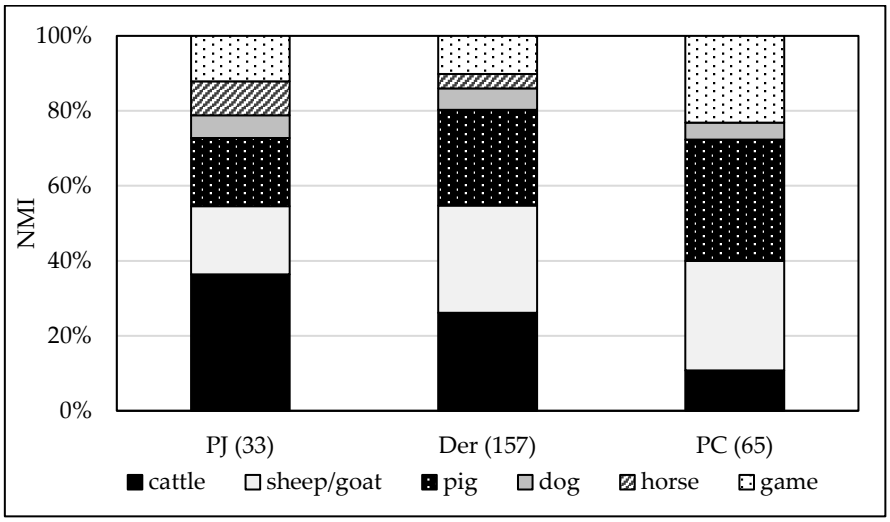


**Fig. 5**. Percentage distribution of minimum number of individuals in different Wietenberg sites (between brackets are the recorded values). Legend: PJ – Pianu de Jos; Der – Derșida; PC – Cauce Cave.
Distribuția procentuală ca număr minim de indivizi în diferite situri Wietenberg (în paranteză se găsesc numărul minim de indivizi). Legenda: PJ – Pianu de Jos; Der – Derșida; PC – Peștera Cauce.

## ◈ Hard animal materials industry

### Raw materials

The types of blank are not very various (tab. 2), but, in this case, we also need to take into account the small number of items. The bones come exclusively from domestic species (*Bos taurus* and *Ovis aries*/*Capra hircus*). The only wild species attested is the red deer (*Cervus elaphus*), from which the antlers were used. Out of the branch, only tines and a segment of beam are present, so it is impossible for us to establish if shed antler or antler from a hunted animal were used, and if they were acquired by hunting or gathering.

| SKELETON ELEMENTS | *Bos taurus* | *Ovis aries*/*Capra hircus* | *Cervus elaphus* | Indeterminate sp. |
|---|---|---|---|---|
| Antler | | | 4 | |
| Tibia | | 1 | | |
| Radius | 1 | | | |
| Long bone diaphysis | | | | 4 |

**Tab. 2.** Distribution on species and on anatomical elements of the different types of raw materials identified at Pianu de Jos-*Lunca Pârâului*.
Repartiția pe specii și pe elemente anatomice ale diferitelor tipuri de materii prime identificate la Pianu de Jos-*Lunca Pârâului*.

### Technological and functional data

### Bone

***Pointed tools*** (n=4). They represent the most important typological category, in the Pianu de Jos assemblage. We identified two typological sub-groups, defined according to the way the blank was obtained. Two items were made out of blank was preserved in its anatomic volume, represented by: *Ovis*/*Capra* tibia (pl. 4/a) and long bone diaphysis (pl. 4/d). The technological scheme is the same: the percussion was applied to form the active front, after which the shaping operation followed. This was realized by longitudinal scraping along the debitage sides (pl. 4/b) or by abrasion around the whole circumference (pl. 4/e), applied only at the distal level.

On flat blank were made, as well, two pointed tools. The first item is a double point (pl. 4/g), realized on a splint taken out of the bone diaphysis. We do not know the procedures used to obtain the blank, because the debitage sides were abraded (pl. 4/h). The shape was created by the abrasion of both extremities, around the entire circumference, the section becoming circular. The extremities are pointed (pl. 4/i), without specific wearing stigmata, thus the conclusion that the item was not used.

The second item (pl. 4/j) is fractured at the mesial level and strongly exfoliated. In this case, as well, the debitage procedures cannot be identified either, because the sides (as much

as has been preserved of them), and both faces were shaped by abrasion (pl. 4/k). The point is fractured *en languette* (pl. 4/l), probably due to functioning.

***Skate*** (n=1). Several fragments have been recovered (pl. 5/a), which, even though they cannot be matched perfectly, seem to come from a single item. This was burnt non-uniformly. The choice of this type of bone is not randomly, because the radius offers a sufficiently wide blank, with a strong structure, which requires a minimal technological investment, for creating a skate. This has a flat surface, intensely worn, and longitudinal scratches parallel to one another (pl. 5/b-c). The wear affected so much certain areas that the medullar channel was attained.

***Indeterminate item*** (n=1). The piece is fractured at both extremities (pl. 5/d), so that we cannot reconstitute its morphology and functionality. This item may have been a pointed tool, having a gloving system. The blank is flat, its debitage sides being abraded (pl. 5/e). At proximal level, two *encoche*s were realized by scraping, but the specific stigmata were covered by abrasion (pl. 5/f). The wear surface is very extensive.

**Antler**

***Bevelled tools*** (n=2). They represent the only typological category made on tine of *Cervus elaphus* antler. The blank preserves the anatomic volume, for both items. In the case of the first piece (pl. 6/a), the segmentation was realized by percussion around the entire circumference (pl. 6/b), followed by detachment through percussion. The point of tine was eliminated by bending, then, the surface was shaped by abrasion. At the distal level, an active front specific of an intermediate tool was arranged. The active front is pressed (pl. 6/c), and at its periphery, on the upper face, a strong polish developed, associated to irregular longitudinal scratches (Fig. 6/d), probably as a result of the wear.

For the second tool we have not identified the segmentation procedure (pl. 6/e), because at this level the item is fractured. One can see, however, that the segmentation plan was shaped (pl. 6/f). At the mesial level, a perforation made by bifacial rotation has been preserved (pl. 6/g). In a subsequent stage, the pearling was eliminated, most probably by percussion (several stigmata have been preserved), after which the whole surface was abraded. The active front is strong tapped (pl. 6/h), associated to a peripheral zone of polish and fine longitudinal scratches.

***Preform*** (n=1). A tine of *Cervus elaphus* antler (pl. 6/i) was cut off from the branch by percussion (pl. 6/j). At the proximal level, a pearling elimination procedure was initiated, by scraping (pl. 6/k). At the same time, longitudinally, a bipartition procedure (probably percussion) was applied, the debitage side being shaped by scraping. The item remained in an intermediate processing stage.

***Blank*** (n=1). A beam of *Cervus elaphus* antler, preserving its anatomic volume, was debited at both extremities, by percussion around the entire circumference, followed by detachment through bending (pl. 6/l). We identified no shaped traces.

## ◈ Discussions

The community of Pianu de Jos-*Lunca Pârâului* did not invest too much time for acquiring the bones that served as raw material because they were most likely recovered from among wastes coming from consumed animals. A proof in this sense is also the lack of preforms and blanks. No attention was given to assuring a raw material reserve, the items being produced *ad-hoc* (according to the needs) and abandoned, when they became impossible

to use (e.g. skate). In exchange, in the case of antler we can speak about preoccupations to assure a reserve (e.g., preform and blank), probably due to the more complex way of acquisition (if fallen antler was used, it was available seasonally) (tab. 3).

| Raw material | Typological category | No. pieces |
|---|---|---|
| Bone | Pointed tool | 4 |
| | Skate | 1 |
| | Indeterminate | 1 |
| Antler | Bevelled tool | 2 |
| | Preform | 1 |
| | Blank | 1 |

**Tab. 3.** Types of products and sub-products of the transformation technological scheme.
Tipuri de produse și sub-produse ale schemei tehnologice de transformare.

The hard animal material industry of the Pianu de Jos settlement includes a total of 10 items, the majority being finite products (8), if we compare them to the number of items under processing – 1 and blanks – 1 (tab. 3). What has drawn our attention was the typological and technological unity of the assemblage, with few variables. So, the transversal debitage was realized by means of a transformation scheme by segmentation and the longitudinal one, by means of a transformation scheme by successive partitions. The debitage technique, both transversally and longitudinally, was percussion. In the surface modification procedures, the technique used the most often was abrasion followed by scraping. For the volume modification procedure, perforation by rotation and scraping were used.

Regarding the functionality of the items, the points on flat blank seem to be related to perforation actions (probably for skins). The different toughness of the materials processed is also reflected in the diverse aspect of the wear of the active extremity. So, the points are strongly rounded (pl. 4/c), without significant loss of matter, with transversal scratches and a strong macroscopic polish (pl. 4/f), proving the processing of the soft materials. In exchange, the small double point, although bearing no wear trace, is a projectile point, being related to the hunting activity.

The skate was clearly used for ice skating. Most likely, the facet was created technologically, to increase friction against the ice and assure stability. Yet, no technological stigmata were identifiable, due to the fact that extended wearing rubbed them off. We can advance the hypothesis of a quite long use, because facet advanced up to the channel, the skate becoming unusable.

The both bevelled tools made of antler show similar wear evolution patterns, characterized by an intense damage of the extremity, which corresponds to their use in a percussion action – breaking/crushing into powder a material (which was impossible to determine).

Related to the archaeological context (tab. 4), the finite items are quite randomly scattered, yet worth mentioning is that the items coming from pits are fractured, whereas, for example, the double point, with no wear stigmata, comes from a dwelling. In the case of the preform and of the blank, the situation is clearer. Their presence in the pits demonstrates intentional abandonment. It is possible that they did not correspond, as dimensions or morphology, to the subsequent processing intentions.

| Artefact type | Archaeological context | No. pieces |
|---|---|---|
| Finished piece | Dwelling | 3 |
| | Pitt | 3 |
| | Archaeological level | 2 |
| Preform | Pitt | 1 |
| Blank | Pitt | 1 |

**Tab. 4.** Archaeological contexts of the artefacts of Pianu de Jos-*Lunca Pârâului* settlement. Contextul arheologic al pieselor din așezarea de la Pianu de Jos-*Lunca Pârâului*.

## ◈ Conclusions

The analysis of the fauna from Pianu de Jos-*Lunca Pârâului* reveals that livestock farming played an important role for the Wietenberg community here. Therefore, cattle are the most numerous irrespective of how we quantify them (NR, MNI and W). They were exploited mainly for meat milk and its derivates but also for traction. Suides and caprines share the second place. If pigs are raised exclusively for meat, fat etc., the sheep and goats were exploited in a mixed manner, both for meat and milk and its derivatives.

The horse, although it shows a small percentage, it was used for mobility, its workforce (traction) and was consumed in terms of food.

Hunting also shows a small percentage, its importance is extremely low given the number ostheological remains and species (only 4).

A comparison with other Wietenberg sites (Derșida and Cauce Cave) which have benefited of archaeozoology studies on relatively large assemblages – over 450 specifically determined ostheological remains – shows an extraordinarily diverse situation that does not allow us at this stage of research to portray this culture in a more pertinent way.

The same conclusion is valid also for the hard animal materials industry that allows us, despite the limited assemblage, to identify some of the daily living activities from the Pianu de Jos community, especially of domestic activities (skin processing) and less of hunt.

Considering this deficiency, we believe that future archaeological and archeozoological research dedicated to the Wietenberg culture, will finally permit a better understanding of the faunal paleoeconomy.

## ◈ Acknowledgments

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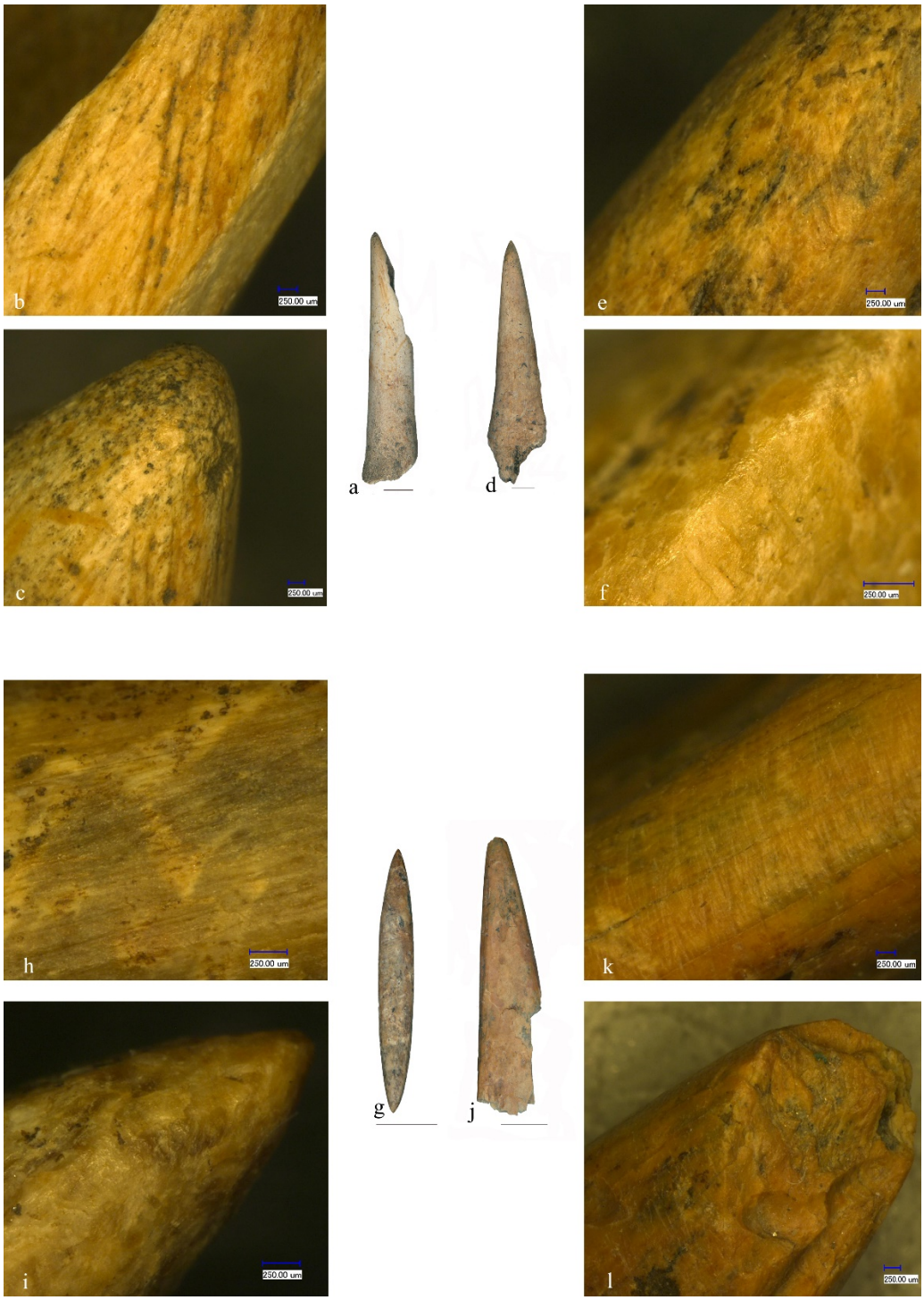
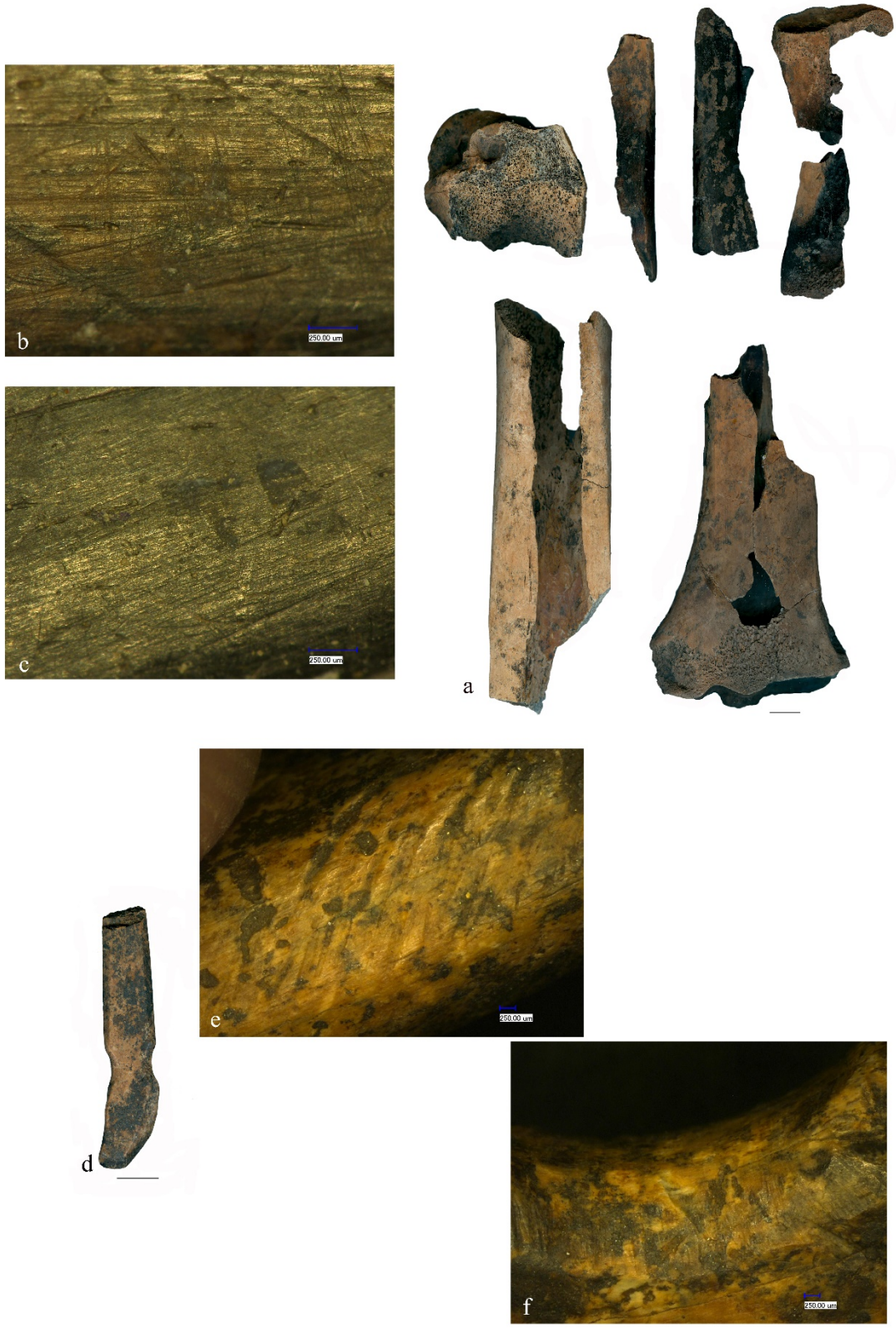
**Pl. 1**. a – Comparison between domestic cattle metatarsals (*Bos taurus*, left) and auroch metatarsals (*Bos primigenius*, right), dorsal aspect; b – Domestic cattle metatarsals (*Bos taurus*), dorsal aspect. The sample in the left shows pathologies consequent to using the animal for traction; c – Comparison between domestic cattle phalanges (*Bos taurus*), dorsal aspect; d – Caprine tibia, plantar view (centimeters scale).
a – Comparație între metatarsiene de vită domestică (*Bos taurus*, în stânga) și bour (*Bos primigenius*, în dreapta), normă dorsală; b – Metatarsiene de vită domestică (*Bos taurus*), normă dorsală. Piesa din stânga prezintă patologii rezultate în urma folosirii animalului la tracțiune; c – Comparație între falangele de vită domestică (*Bos taurus*), normă dorsală; d – Tibie de ovicaprină, normă plantară (scara în centimetri).


**Pl. 2.** a – Pig humerus (*Sus domesticus*), cranium view; b – Upper canine of male pig (*Sus domesticus*), norma lateralis; c – Pig metatarsal (*Sus domesticus*) showing pathologies of the diaphysis, norma dorsalis; d – Dog tibia (*Canis familiaris*), norma dorsalis.
a – Humerus de porc (*Sus domesticus*), normă cranială; b – Canin superior de mascul de porc (*Sus domesticus*), normă laterală; c – Metatars de porc (*Sus domesticus*) cu patologie la nivelul diafizei, normă dorsală; d – Tibie de câine (*Canis familiaris*), normă dorsală.

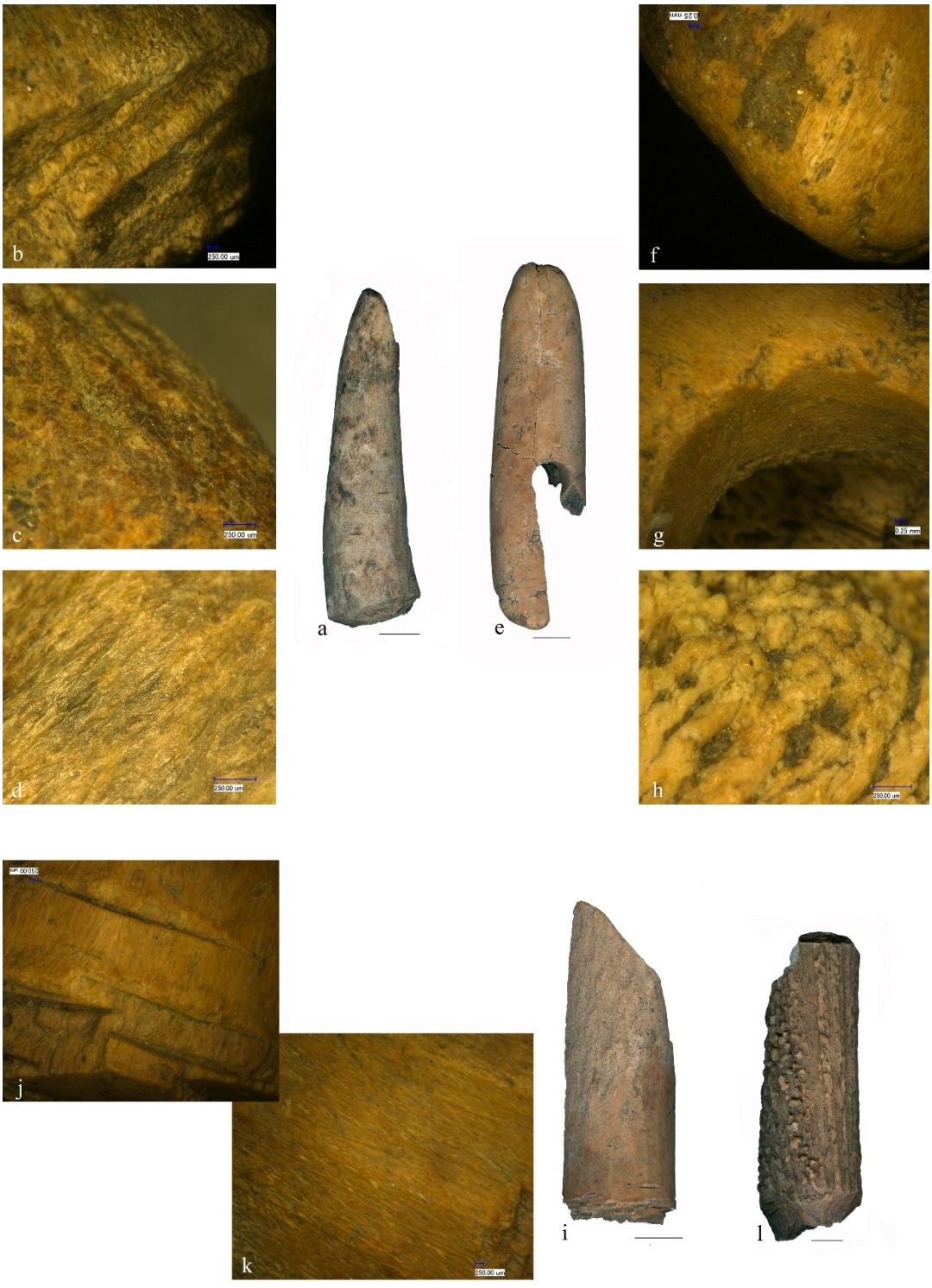

**Pl. 3.** a – Horse radius (Equus caballus), norma dorsalis; b – Deer phalanx I (*Cervus elaphus*), norma dorsalis; c – Hare tibia (*Lepus europaeus*), norma plantaris.
a – Radius de **c**al (*Equus caballus*), normă dorsală; b – Falanga I de cerb (*Cervus elaphus*), normă dorsală; c – Tibie de iepure (*Lepus europaeus*), normă plantară.




**Pl. 4.** Pointed tools: a, d – Pointed tools manufactured on blank in volume; b – development by scraping of the active front (50x); c, f – detail of the active front's morphology (50x; 150x); e, k – development by abrasion of the active front (50x; 50x); g, j – pointed tools made on flat blank; h – processing by scraping of the surface (100x); i, l – detail of the active front's morphology (100x; 50x).
Vârfuri: a, d – vârfuri confecționate pe suport în volum; b – amenajarea prin *raclage* a vârfului (50x); c, f – detaliu al frontului activ (50x; 150x); e, k – amenajarea prin abraziune a vârfului (50x; 50x); g, j – vârfuri confecționate pe suport plat; h – amenajarea suprafeței prin *raclage* (100x); i, l – detaliu al frontului activ (100x; 50x).




**Pl. 5.** Tools made of bone: a – skate; b, c – detail of the wear side (150x, 150x); d – indeterminate tool; e – abrasion of the debitage sides (50x); f – detail of the *encoche* (50x).
Utilaje confecționate din os: a – patină; b, c – detalii ale fațetei de uzură (150x; 150x); d – utilaj indeterminat; e – abraziunea laturilor de debitaj (50x); f – detaliu *encoche* (50x).




**Pl. 6.** Tools processed from *Cervus elaphus* antler: a, e – bevelled tools; b, j – segmentation by percussion (30x, 30x); c, g – detail of the active front's morphology (100x; 150x); d – detail of the wear surface (150x); f – detail of the proximal extremity (25x); g – detail of the perforation (25x); i – preform; k – processing of the surface (30x); l – blank.
Utilaje prelucrate din corn de *Cervus elaphus*: a, e – utilaje de tip daltă; b, j – segmentare prin percuție (30x; 30x); c, h – detaliu al frontului activ (100x; 150x); d – detaliu al zonei de uzură (150x); f – detaliu al extremității proximale (25x); g – detaliu al perforației (25x); i – preformă; k – amenajare suprafață (30x); l – suport.

**Annex 1.** Number of remains identified in Wietenberg complexes at Pianu de Jos-*Lunca Pârâului*.
Numărul de resturi identificate în complexe Wietenberg la Pianu de Jos-*Lunca Pârâului.*

| **Taxa/complexes** | **C18** | **C 20** | **C21** | **C27** | **C34** | **C 35** | **C37** | **C38** | **C40** | **C41** | **C50** | **C60** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Bos taurus (cattle)* | 12 | 60 | 8 | 3 | 2 | 25 | 2 | 1 | 24 | 7 | 3 | 3 |
| *Ovis aries (sheep)* | | 2 | 2 | | | | | | | | 1 | |
| *Ovis aries/Capra hircus (sheep/goat)* | | 16 | 21 | | | 2 | | | 23 | | 1 | 2 |
| *Sus domesticus (pig)* | 2 | | 3 | | | 5 | | 1 | 10 | | 2 | |
| *Canis familiaris (dog)* | | 4 | | | | | | | 1 | | 1 | |
| *Equus caballus (horse)* | 2 | 2 | 3 | 1 | | 7 | | | 2 | | | |
| *Sus scrofa (wild boar)* | | | | | | 1 | | | | | | |
| *Bos primigenius (aurochs)* | | | | | | | | | | | | |
| *Cervus elaphus (red deer)* | | | | | | | | | | | | |
| *Lepus europaeus (hare)* | | | | | | | | | | | 1 | |
| **Total mammals identified** | **16** | **84** | **37** | **4** | **2** | **40** | **2** | **2** | **60** | **7** | **9** | **5** |
| Large mammals, unidentified | 18 | 53 | 31 | 3 | 2 | 35 | 3 | 2 | 23 | 10 | 10 | 4 |
| Medium mammals, unidentified | 5 | 60 | 10 | 3 | | 27 | | 2 | 45 | 5 | 3 | 3 |
| **Total mammals** | **39** | **197** | **78** | **10** | **4** | **102** | **5** | **6** | **128** | **22** | **22** | **12** |
| *Cervus elaphus* (antlers) | | | | | | | | | | | | |
| **Total fauna** | **39** | **197** | **78** | **10** | **4** | **102** | **5** | **6** | **128** | **22** | **22** | **12** |

| **Taxa/complexes** | **C71** | **C81** | **C88** | **C90** | **C97** | **C99** | **C100** | **C101** | **C105** | **C106** | **C112** | **C116** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Bos taurus (cattle)* | 4 | | 2 | 12 | 1 | 1 | 2 | 1 | 27 | 2 | 4 | 6 |
| *Ovis aries (sheep)* | | | | | | | | | 1 | | | |
| *Ovis aries/Capra hircus (sheep/goat)* | 1 | | | | | 1 | 2 | | 14 | | 1 | 3 |
| *Sus domesticus (pig)* | 1 | 1 | 3 | | 1 | 4 | | | 8 | | 3 | 1 |
| *Canis familiaris (dog)* | | | 1 | | 1 | | | | 3 | | | |
| *Equus caballus (horse)* | | | | | | | | | | | | 2 |
| *Sus scrofa (wild boar)* | | | | 1 | | | | | | | | |
| *Bos primigenius (aurochs)* | | | | | | | | | | | | |
| *Cervus elaphus (red deer)* | | | | 1 | | | | | 2 | | | |
| *Lepus europaeus (hare)* | | | | | | | | | | | | |
| **Total mammals identified** | **6** | **1** | **6** | **14** | **3** | **6** | **4** | **1** | **55** | **2** | **8** | **12** |
| Large mammals, unidentified | | 1 | 11 | | 7 | 5 | | | 45 | | 6 | 12 |
| Medium mammals, unidentified | 1 | | 20 | | 2 | 5 | 1 | | 42 | | 7 | 3 |
| **Total mammals** | **7** | **2** | **37** | **14** | **12** | **16** | **5** | **1** | **142** | **2** | **21** | **27** |
| *Cervus elaphus* (antlers) | | | | | | | | | 1 | | 1 | 1 |
| **Total fauna** | **7** | **2** | **37** | **14** | **12** | **16** | **5** | **1** | **143** | **2** | **22** | **28** |

| **Taxa/complexes** | **C120** | **C122** | **C124** | **C125** | **C127** | **C131** | **C132** | **C134** | **C142** | **C143** | **C148** | **C149** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Bos taurus (cattle)* | 4 | | 3 | | 3 | 2 | 1 | 6 | 2 | 3 | 4 | 2 |
| *Ovis aries (sheep)* | | | | | | | | | | | | |
| *Ovis aries/Capra hircus (sheep/goat)* | | | 1 | | | 1 | | 4 | | | | |
| *Sus domesticus (pig)* | | 2 | | 1 | | | | 2 | | 2 | | |
| *Canis familiaris (dog)* | | | | | | | | | | | 1 | |
| *Equus caballus (horse)* | | 1 | | | 1 | | | 1 | | 2 | 2 | |
| *Sus scrofa (wild boar)* | | | | | | | | | | | | |
| *Bos primigenius (aurochs)* | | | | | | | | | | | | |
| *Cervus elaphus (red deer)* | | | | | | | | | | | | |
| *Lepus europaeus (hare)* | | | | | | | | | | | | |
| **Total mammals identified** | **4** | **3** | **4** | **1** | **4** | **3** | **1** | **13** | **2** | **7** | **7** | **2** |
| Large mammals, unidentified | 3 | 5 | | 2 | 4 | | | 2 | 1 | 10 | 10 | 2 |
| Medium mammals, unidentified | | 5 | | 3 | | | | 10 | | | | |
| **Total mammals** | **7** | **13** | **4** | **6** | **8** | **3** | **1** | **25** | **3** | **17** | **17** | **4** |
| *Cervus elaphus* (antlers) | 1 | | | | | | | | | | | |
| **Total fauna** | **8** | **13** | **4** | **6** | **8** | **3** | **1** | **25** | **3** | **17** | **17** | **4** |

**Annex 1.** (continued/continuare)

| Taxa/complexes | C154 | C157 | C168 | C169 | C176 | C177 | C181 | C185 | C198 | C209 | C211 | C217 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Bos taurus (cattle)* | | 1 | 9 | 8 | 4 | 1 | 1 | 3 | 2 | | 3 | |
| *Ovis aries (sheep)* | | | | 1 | | | | | | | | |
| *Ovis aries/Capra hircus (sheep/goat)* | | | 6 | | | | | | | | | |
| *Sus domesticus (pig)* | 1 | 2 | 2 | | | | | | 1 | 1 | 1 | |
| *Canis familiaris (dog)* | | | | | | 1 | | | | | | |
| *Equus caballus (horse)* | | | | 1 | | | | | 1 | | | |
| *Sus scrofa (wild boar)* | | | | | | | | | | | | |
| *Bos primigenius (aurochs)* | | | | | 1 | | | | | | | |
| *Cervus elaphus (red deer)* | | | | | | | | | | | | |
| *Lepus europaeus (hare)* | | | | 1 | | | | | | | | |
| **Total mammals identified** | **1** | **3** | **17** | **11** | **5** | **2** | **1** | **3** | **4** | **1** | **4** | |
| Large mammals, unidentified | | | 7 | 5 | 9 | 30 | 2 | 7 | 1 | | 10 | |
| Medium mammals, unidentified | 1 | | 6 | | | 16 | | 6 | | | | |
| **Total mammals** | **2** | **3** | **30** | **16** | **14** | **48** | **3** | **16** | **5** | **1** | **14** | |
| *Cervus elaphus* (antlers) | | | 1 | | | | | | | | | 1 |
| **Total fauna** | **2** | **3** | **31** | **16** | **14** | **48** | **3** | **16** | **5** | **1** | **14** | **1** |

| Taxa/complexes | C220 | C229 | C230 | C231 | C235 | C237 | C238 | C239 | C243 | C244 | C245 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Bos taurus (cattle)* | 5 | 1 | 3 | 2 | 2 | 2 | 1 | 4 | 1 | 2 | 1 |
| *Ovis aries (sheep)* | | | | | | | | | | | |
| *Ovis aries/Capra hircus (sheep/goat)* | | | 1 | | | | | 1 | | | |
| *Sus domesticus (pig)* | | | | | | 1 | | 1 | | | |
| *Canis familiaris (dog)* | | | | | | | | | | | |
| *Equus caballus (horse)* | | | | | | | | | | 1 | |
| *Sus scrofa (wild boar)* | | | | | | | | | | | |
| *Bos primigenius (aurochs)* | | | | | | | | | | | |
| *Cervus elaphus (red deer)* | | | | | | | | | | | |
| *Lepus europaeus (hare)* | | | | | | | | | | | |
| **Total mammals identified** | **5** | **1** | **4** | **2** | **2** | **3** | **1** | **6** | **1** | **3** | **1** |
| Large mammals, unidentified | 3 | 2 | 1 | | 5 | 20 | | 3 | | 10 | |
| Medium mammals, unidentified | 1 | | | | | 10 | | 1 | | | |
| **Total mammals** | **9** | **3** | **5** | **2** | **7** | **33** | **1** | **10** | **1** | **13** | **1** |
| *Cervus elaphus* (antlers) | | | | | | | | | | | |
| **Total fauna** | **9** | **3** | **5** | **2** | **7** | **33** | **1** | **10** | **1** | **13** | **1** |

**Annex 2.** Metrical data of the mammals remains (after von Den Drisch 1976). The values are in millimetres.
Date metrice ale resturilor de mamifere (după von Den Drisch 1976). Valorile sunt în milimetri.

***Bos taurus***

| MANDIBULA | C23 |
|---|---|
| 10L | 42,2 |
| 10B | 17,5 |

| COXAL | C40 |
|---|---|
| LA | 62,5 |
| LAR | 53 |

| TIBIE | C23 |
|---|---|
| Bd | 62,3 |
| Dd | 50,1 |

| ASTRAGAL | C116 | C21 | C120 |
|---|---|---|---|
| GLl | 61,8 | (70,5) | 60,9 |
| Glm | 56,4 | 65,3 | |
| Dl | (36,1) | 40,1 | 33,5 |
| Dm | 34,5 | 39,5 | |
| Bd | 42,3 | 47,7 | 38 |

| METATARS | C23 | C23 | C23 | C211 |
|---|---|---|---|---|
| Bp | 66,9 | 52,5 | | (50) |
| DAPp | 65 | 47 | | |
| Bd | | | 54 | |
| DAPd | | | 32 | |

| SCAPULA | C23 | C23 |
|---|---|---|
| SLC | 65 | 56,3 |
| GLP | 76,4 | (63,3) |
| BG | 60,8 | |

| RADIUS | C210 | C210 |
|---|---|---|
| Bd | 64,2 | 77,1 |
| BFd | 60 | 74,8 |
| Dd | 40 | 48,5 |

| METACARP | C35 | C41 | C217 |
|---|---|---|---|
| Bp | 56 | | |
| DAPp | 34,5 | | |
| Bd | | 54,7 | 64,3 |
| DAPd | | 29,5 | 30,1 |

| CALCANEU | C90 |
|---|---|
| GL | 115,8 |
| GB | 38,8 |

| FALANGA 1 | C20 | C20 | C20 | C40 | C23 | C23 | C23 | C23 | C23 | C116 | C116 | C62 | C62 | C62 | C120 | C101 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GL | 65,3 | (64) | 57 | 55,4 | 60,8 | 60,2 | 64,3 | 62,2 | 63,4 | 52,8 | 53,3 | 52,7 | 50,7 | (56,6) | 52,1 | 63,5 |
| Bp | 30,6 | (28,6) | 34,6 | 28,9 | 31,1 | 33,2 | 31,5 | 31,8 | 34 | 30,8 | 31,1 | 25,5 | 25,8 | 29,5 | 27 | 29,7 |
| SD | 31,5 | 25,7 | 28,3 | 23,7 | 25 | 27,2 | 26 | 26,3 | 29,2 | 25,5 | 26,6 | 20 | 22,8 | 23,3 | 22,9 | 23,9 |
| Bd | 29,8 | 29,7 | 34,7 | 25,7 | 29,3 | 30,3 | 29,5 | 28,2 | 31,3 | 29,5 | 31 | 24,2 | 25 | 27,1 | 26,9 | 27,5 |

| FALANGA 2 | C35 | C20 | C23 | C116 | C90 | C174 |
|---|---|---|---|---|---|---|
| GL | 37,7 | 43,8 | | 37,4 | 35,2 | 41,6 |
| Bp | 33,9 | 33,3 | 34,8 | (27) | 28 | 33 |
| SD | 30 | 24,6 | 26,3 | 23,5 | 22 | 26,7 |
| Bd | 30,3 | 26,9 | | 24,5 | 23,1 | 27,2 |

| FALANGA 3 | C20 | C186 |
|---|---|---|
| DLS | (64,5) | 74 |
| Ld | 54 | 56,8 |
| MBS | 22,1 | 22,8 |

**Annex 2.** (continued/continuare)

***Sus domesticus***

| SCAPULA | C40 | C134 |
|---|---|---|
| SLC | 25 | 23,7 |
| GLP | 35 | 35,3 |
| LG | | 31,3 |
| BG | 27,4 | 24,8 |

| HUMERUS | C105 |
|---|---|
| Bd | 44,5 |
| BT | 35,1 |

| ASTRAGAL | C23 |
|---|---|
| GLl | 37,6 |
| GLm | 35,6 |
| Bd | 20,7 |
| Dl | 20,2 |
| Dm | 22,5 |

| FALANGA 1 | C40 | C134 |
|---|---|---|
| GL | 38,4 | 35,5 |
| Bp | 15,7 | 16,6 |
| SD | 12,5 | 13,1 |
| Bd | 14,2 | (15,1) |

***Canis familiaris***

| TIBIE | C177 |
|---|---|
| Bd | 22,7 |
| Dd | 15,6 |

***Equus caballus***

| RADIUS | C148 |
|---|---|
| Bd | 74,8 |
| BFd | 66,4 |
| Dd | 38,7 |

***Cervus elaphus***

| FALANGA 1 | C20 | C23 | C105 | C105 |
|---|---|---|---|---|
| GL | 60,4 | 63,8 | 57,5 | 53,2 |
| Bp | 24,6 | | 22,4 | 21 |
| SD | 19,8 | | 17,3 | 16,1 |
| Bd | 23,4 | 24 | 20,6 | 20,9 |

**Annex 3.** Anatomical elements distribution for the mammals at Pianu de Jos-*Lunca Pârâului*.
Distribuția elementelor anatomice pentru mamiferele de la Pianu de Jos-*Lunca Pârâului*.

| ANATOMICAL ELEMENT | *Bos taurus* | *Ovis aries* | caprines | *Sus domesticus* | *Canis familiaris* | *Equus caballus* | *Bos primigenius* | *Cervus elaphus* | *Sus scrofa attila* | *Lepus europaeus* |
|---|---|---|---|---|---|---|---|---|---|---|
| Cornua | | | | | | | | 6 | | |
| Neurocranium | 10 | | | 2 | 1 | | | | | |
| Viscerocranium | 6 | | 2 | 4 | 1 | | | | | |
| Dentes sup. | 9 | | 5 | | | 7 | | | 1 | |
| Mandibula | 25 | 1 | 5 | 17 | 4 | 2 | | | | |
| Dentes inf. | 17 | | 2 | 3 | | 4 | | | | |
| Dentes | 1 | | | | | | | | | |
| Atlas | 1 | | | | | | | | | |
| Epistropheus | 2 | | | | | | | | | |
| et Vert. cv. | 5 | | | | | | | | | |
| Vert. thor. | 3 | | 2 | | | | | | | |
| Vert. lumb. | 4 | | 1 | | | | | | | |
| Sacrum | | | 2 | | | | | | | |
| Vert. caud. | 1 | | | | | | | | | |
| Costae | 49 | | 20 | 4 | 1 | | | | | |
| Sternum | | | 2 | | | | | | | |
| Scapula | 12 | | 6 | 3 | | | | | | |
| Humerus | 20 | | 7 | 2 | | | | | | |
| Radius | 15 | 2 | 13 | 1 | 1 | 1 | | | | |
| Ulna | 5 | 1 | 3 | 6 | 1 | 1 | | | 1 | |
| Radio–Ulna | | | 1 | | | | | | | |
| Carpalia | 1 | | | | | 2 | | | | |
| Metacarpus | 13 | | | 1 | 1 | | | | | |
| Pelvis | 10 | | | 2 | | 1 | | | | |
| Femur | 11 | | 7 | 2 | | | | | | |
| Patella | | | | | | 1 | | | | |
| Tibia | 18 | 2 | 13 | 3 | 1 | | | | | 2 |
| Fibula | | | | 2 | | | | | | |
| Talus | 8 | 1 | 1 | | | | | | | |
| Calcaneus | 3 | | 1 | 2 | | | | 1 | | |
| et Tarsalia | 2 | | | | | | 1 | | | |
| Metatarsus | 13 | | 5 | 3 | 2 | | | | | |
| Metapodalia | 8 | | 3 | 2 | | 6 | | | | |
| Phalanx 1 | 18 | | | 3 | | 3 | | 2 | | |
| Phalanx 2 | 5 | | | | | | | | | |
| Phalanx 3 | 3 | | | | | 1 | | | | |
| **TOTAL** | **298** | **7** | **101** | **62** | **13** | **29** | **1** | **9** | **2** | **2** |