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REVIEWS

IN MEMORIAM

VILLA RUSTICA FROM RAPOLTU MARE-*LA VIE* (HUNEDOARA COUNTY). PRELIMINARY ZOOARHEOLOGICAL DATA*

Georgeta El Susi[1], **Andrei Gonciar**[2]

Abstract: *The article analyzes a fauna sample collected from a villa rustica in Rapoltu Mare, Hunedoara County. The material was gathered during the 2014–2017 seasons consisting of 1,406 fragments, 1,049 of which are fragments from the Roman levels (2nd–3rd centuries AD), and 357 are post–Roman fragments. Cattle dominate the Roman Phase I sample with 33.33%, followed by sheep/goats with 22.22% and pigs with 16.66%. Cattle dominate as fragments in the phases II–III, accounting for 32.02%, followed by small ruminants with 28.43% and pigs with 26.47%. The bones of the dog total 1.31%, while those of the horse, 6.21%. Hunting was a recreational activity, used to obtain furs, hides, antlers, with little impact on food supplying. Hunted prey includes hare, roe deer, red deer, beaver and various small carnivores. Sheep and goats account for 34–37% (NISP/MNI) of livestock at the post-Roman level, followed by pigs (26–27%) and bovines (18–24%). The horse has a threefold quota in comparison with the Roman levels, about 13–15%.*

Keywords: *Rapoltu Mare, Roman epoch, villa rustica, animal breeding, age profiles*

The village of Rapoltu Mare is situated 1.5 kilometers upstream from the junction of the Strei and Mureş rivers, northwest of Culoar Orăştie. The archaeological site from the called La Vie is located in the northwest of Rapoltu Mare, on the second terrace of Mureş, 1.5 km away from its right bank and 440 m north of county route 107A. The systematic research, which resumed in the summer of 2013, has led to the discovery of settlements from Prehistoric to modern times. The best documented settlement is the Roman epoch through a *villa rustica* built on the terrace of Mureş, dated between the 2nd and 3rd centuries AD[3]. Until now the excavations have focused on a complex of buildings on the southern side of the villa, specifically the entrance and a central edifice, identified respectively as Sp. I and Sp. II (Fig. 1).

The excavations in the two areas emphasized several phases and subphases of the development of the building complex. Chronologically speaking, there were two major stages of living on the terrace in the Roman era, separated by a short span of abandonment. The first phase started in the first quarter of the 2nd century AD, when the end of the terrace was leveled and a lightweight structure with wooden walls was erected. The ephemeral structure most likely served as shelter during the construction of the first stone buildings. During the first phase, several edifices were erected as well as a perimeter wall delimiting a quadrilateral-shaped enclosure. The complex of buildings ended violently by fire. In the second stage of construction, started in the latter part of the 2nd century AD, the enclosure wall was rebuilt and new buildings were

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[3] BARBU ET AL. 2019A, 245.

erected. The building complex ended violently by a fire. During the 3rd century AD, a second phase of settlement followed, new buildings being constructed within the enclosure. The third stage of construction was best highlighted in Sp. II/2016. The Roman habitation ended violently, the entire residence was destroyed during the 3rd century AD[4]. After the abandonment of Dacia, the area was still used by human communities, evidenced by post-Roman ceramic artifacts being present in all stratigraphic units from Rapoltu Mare[5].

During archaeological excavations from 2014 to 2017, animal bones were also found; their analysis is the subject of this article. The assemblage consists of 1,406 fragments, 1,049 of which come from levels dated between 2nd–3rd centuries AD, and 357 from post Roman period. In addition, 18 fragments from the early Neolithic and 15 from the Middle Age were collected. Their presentation of the early Neolithic and the Middle Age samples will be done on another occasion.

Taphonomy

The mammalian sample is highly fragmentary, with no complete bones, except for several phalanges and tarsals. The material of the horse and dog is also broken. In the case of the dog, the bones are "lost" from the skeletons, probably discarded somewhere else. As a result of the fired structures, about 20 fragments of the first phase are calcined. About 30 bones from the third phase are also calcined and another 10 have black and reddish spots; among them, a distal horse radius broken lengthwise, with burn spots on the broken side, and five burnt chips from another distal radius. Both pieces were collected from Sp. II/ S8. From Sp. II/ S5, a pig distal humerus, a rib, a scapular spine and three bovine phalanges were collected, all burned. In addition to fire damage, many bones were degraded by the plant roots (Fig. 10/ b, c).

The bones are highly fragmented, making it difficult to identify the cut marks, however few. Some fragments bear traces of disarticulation, breaking the carcass into small parts or defleshing. From the early phase, below the wall/ Z. 22, a pig distal humerus with fine incisions to remove the muscles was collected. The most pieces with such marks were collected from the third phase. From Sp. II/ S5 there is a cattle scapula with notches on the collar. From the same context the following bones were picked: a longitudinally broken distal tibia from cattle with a marginal notch (Fig. 8/b); a cattle pelvis splinter with an incision above the acetabulum; a bovine proximal phalanx with successive coarse cuts on its lateral side to remove the hoof (Fig. 8/c); a goat's horn with two cuts towards the medial face to take out from the frontal (Sp. II/ S2). Three swine ribs from Sp. II/ S5 have oblique cutting marks (Fig. 8 d-f). A proximally unfused bovine calcaneus comes from the metal processing area[6] with distal cuts, to remove the foot (Fig. 8/ a).

When the skin and ligaments are removed, another group of traces is observed. These fine traces are always visible on proximal phalanges and astragali from cattle. A phalanx from Sp. II/ S5. (Fig. 10/c) and an astragalus from Sp. II/ S2 are two examples. Another proximal phalanx with fine cuts on the diaphysis collected from the post-Roman level (Fig. 9/c). A distal metacarpus from a bovine was discovered in Sp. II/S 2–5. Its condyles are worn (Fig. 10/a); perhaps it was used as a polishing tool. A post-Roman cattle rib worn lengthwise was possibly used to degrease the skin. A lower molar (M3) of cattle with a cup-like erosion[7], the specimen being of old age (9–11 years) is also mentioned.

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4 BARBU ET AL. 2019A, 246–248.

5 BARBU ET AL. 2016, 289.

6 Originated in a specimen less than 3 years old..

7 HAIMOVICI/HRISANIDI 1969, 218.

Spatial distribution of the bones in the 1st phase structures

The first building phase provided 182 animal remains, of which 54 were found in Sp. I and 128 in Sp. II. Out of the 54 bones, 20 pieces were removed from the courtyard to the N of the wall/ Z. 3[8]. It is about four cattle bones (Tab. 3) from a juvenile and an adult. A radius, an ulna and a lower tooth come from an adult horse; in addition we have four bones from a sheep 10–12 months old and 10 undetermined flakes. A petrified fragment of a stag's antler and a goat's distal humerus were taken below the floor of a room from the tower. Four indeterminate sherds and a long frog bone (*Rana* sp.) were collected underneath the Z. 1. Another 26 bones come from above a clay layer in the pavement area (Cx. 6), eastward of the Z. 5[9]. These are nine bones from two cattle (one sub-adult and one young adult) and two bones from a 16–18 month old pig. A shoulder blade with GLP/ LG = 26/ 31/ 26.5 mm[10] comes from a robust dog, over 60 cm waist; another 14 breaks are undetermined.

The 128 bones gathered from Sp. II also belong to the first phase. Thus, 31 cracks originate from the burned level, of which 25 are undetermined, most calcined. In addition, two remains from an ovicaprid (rib, centrotarsal), two dental remains from an adult sow, a fragment of a bovine horn, and a fragment of a turtle plastron were identified. There are 37 bones that emerge from below the level of the Z. 22; about 20 of them were identified. There are 11 components removed from the pig, indicating at least one subadult female. A mandible from a mouse and three fragments from a 12–14 months old sheep were also found, along with a metapodium splinter from a red deer. It is possible that the mouse bone to be not in relation to that archaeological deposit. An ulna with a GL = 40 mm was assigned to a turtledove-sized bird.

The 60 remains that completed the early Roman sample of Sp. II were found in S8, subsections north-south, depth 0.50-0.85 m[11]. Among them, 41 are indeterminable and a medium phalanx originates from beaver; from a ewe aged 4–6 years comes a metatarsus, a horn splinter and a mandible. A calcaneus, an upper molar, an unfused proximal phalanx belongs to another small ruminant, slaughtered earlier than 7–10 months. From two cattle slaughtered below 3–4 years and over 9–10 years come six remains, and from a mature pig, another four. In addition, mentioning a fragment of a clam shell and a piece of a plastron from *Testudo* sp. In conclusion, from the early phase of the villa (first half of the 2nd century AD), 182 bones have been analyzed, of which 177 come from mammals and 5 from other animals (Tab. 1). Cattle prevail with 32.78%, pig has a similar percentage (31.15%) and small ruminants are fewer (26.23%). The horse makes up 4.92% and the dog 1.64%. Domestic species total up 96.72%. Roe deer and beaver have 1.64% each (Tab. 2). They are obviously intermediate percentages, the excavation of the site is ongoing.

The sample generated a minimum of 18 individuals, 16 of which come from domestic mammals (88.88%) and two from wilds (11.12%). Among the six bovine one is juvenile, two subadults, two adult and one mature-senile[12] The 19 pig remains come from the skeletons of three individuals, two of which were slaughtered between 14–18 months and one over 5 years (Table 7). 16 ovicaprid bones were supposed from three juveniles and one adult (Table 6). The three horse bones belong to a 3–5 year old individual, sacrificed or killed. The age cannot be specified for two animals.

To centralize data related to the distribution of skeletal elements, we used the following categories: A- cranium, B- spine (axial), C, D- girdles and fleshy parts of the fore limbs (scapula, humerus, radius, and ulna) and hind limbs (pelvis, femur, tibia, fibula, and patella). The feet

[8] BĂEȘTEAN ET AL. 2015, 121.
[9] BĂEȘTEAN ET AL. 2015, 122.
[10] Measurements *apud* A. VON DEN DRIESCH 1976, 75.
[11] BĂEȘTEAN ET AL. 2017, 111.
[12] FOREST 1997, 951–958.

elements (carpals, tarsals, metapodii and phalanges), without food value were included in category E. Therefore, distribution of bones in the five body regions[13] highlights some interesting aspects. In the case of cattle, the bonny elements of C, D categories account for 40%; for pig, most of the remains originate from head and spine, the small bones of the feet are missing; in sheep/goat, appendicular skeletal elements predominate (Table 3; Figure 4). From horse come a tooth, a radius and an ulna, with traces of old breaking. Although the two remains are from fleshy parts, they do not represent conclusive evidence for the horse meat using in human diet. In most antique literature, hippophagy is not mentioned at all, horse meat not being a normal part of the Roman diet. According to archaeozoological opinion, the few cut marks on the horse bones may be associated with skinning and cutting them into small pieces before burying. Sometimes pieces of meat may have been used to feed the dogs[14]. *Whatever the reason, it is clear that those who considered themselves Roman only consumed horsemeat in dire emergencies*[15].

Spatial distribution of the bones in the 2nd phase structures

With regard to bones, the phase is little documented, with materials dating back to the end of the second century AD[16]. Of the 21 animal bones, three were recovered from Sp. I and 18 from Sp. II. Two ribs of small ruminants and a pig neurocranium were collected from the upper chamber of the gate tower (Sp. I)[17]. Other 18 fragments were gathered from Sp. I. Among them, to mention a horse mandible condyle, a femur from a sheep 18–26 months old[18], a rib and a proximal metatarsus from cattle. 14 bones were not specifically assigned (Tab. 1). Overall, the bones originated from one cattle, one pig, one horse and two small ruminants. Since the second phase of habitation continued along the 3rd century AD, the bones of both phases were quantified together[19].

Spatial distribution of the bones in the 3rd phase structures

The sample of this level, dated in the first half of the 3rd century AD is numerous. It consists of 846 fragments, of which 53 come from Sp. I and 793 from Sp. II. The 53 bones were recovered from different stratigraphic units. From the courtyard in Sp. I/ S1 a medium phalanx and two metapodial splinters of a cattle, and a sheep horn splinter were gathered; other three remains are indeterminate. 30 bones were taken from the upstairs chamber of the gate tower; 19 of them are unidentifiable, what is left originates to the following species: a clam valve (*Unio sp*.), a pig astragalus with GLl/ GLm/ Bd = 40/ 37/ 33 mm[20] and four bones from two cattle: a cervical vertebra, two metapodial diaphysis, and an upper tooth. The two individuals were slaughtered shortly after 24–30 months and between 6.5–9 years[21]. A humerus, ulna, rib, vertebra and femoral head were collected from the same area; all belong to a horse less than 3–3.5 years old. The floor of *opus signinum* (C × 1)[22] yielded 16 remains: a clam valve (*Unio sp*.), a mouse humerus, a subadult pig tibia, a young horse incisor and three bones from a bovine, slaughtered around 3.5–4 years. Other nine remainders are not assigned.

13 *apud* REITZ/ WING 2008, 217.
14 LAUWERIER 1988, 163 and related bibliography.
15 JOHNSTONE 2004, vol. 1, 64.
16 BARBU ET AL. 2019a, 247.
17 BARBU ET AL. 2019b, 2019, 68.
18 Long bones fusing *apud* UDRESCU ET AL. 1999, tab. 3.7, 60.
19 BARBU ET AL. 2019a, 248.
20 The animal was 73.9 cm tall.
21 H/DT for M^2=1,5 *apud* BLAISE 2009, vol. 1, fig. 35, 132.
22 BARBU ET AL. 2019B, 2019, 68–69.

The third phase of construction was also dug in Sp. II/ 2016, as part of the research of a construction group in the central area of the *villa*. The wagon-type structure is composed of four rooms, being built after 205 AD, according to archaeological data[23]. Most fauna remains were recovered below the collapsed roof of the building, as well as from the trampling level in the rooms[24]. The sample consists of 793 bones, 786 of which come from mammals. From a small-sized wild bird originates a humerus with GL = 35 mm; five valves belong to clams, and a fragment to a tortoise plastron. From wild mammals come 17 bones of the following taxa: red deer, roe deer, beaver, hare, fox and marten. 263 fragments were assigned to domestic mammals, including the following taxa: cattle, pig, sheep, goat, horse and dog (Tab. 1). The grouping is dominated by cattle with 88 fragments from at least 14 individuals. Of these two have been slaughtered below 2–2.5 years, seven between 2–3.5/4 years, two between 3.5/4- 6.5 years, one between 6.5–9 years and two over 9–11 years (Tab. 5). As for the skeletal elements distribution (Tab. 4), 25% are cephalic remains and 19.32% from spine. The significant amount of ribs grouped in the indeterminate category represents a bias factor. In all contexts, the category is underrepresented. Most of the cattle remains come from fleshy segments of the limbs (28.41) and from feet (27.27%).

The 78 pig bones were assigned to 11 individuals, slaughtered as follows: two under 6 months, two between 6–10 months, four between 1–2 years, one between 3–6 years and one over this limit (Tab. 7). Dental remains are well preserved, totaling 21.8%. Their high proportion suggests slaughtering and processing pig carcasses within the area of the site. The column components are relatively numerous, 25.64%. About 39.74% of the bone elements come from the fleshy parts of the limbs. The distal extremities bones have a low contribution, only 12.83%. Presumably, these pieces were also eaten by humans or animals; being small items were rolled up, lost in the layer.

81 bones were collected from the small ruminants, of which 11 belonged to sheep, 23 to goats, and 47 taxonomically unidentified. The sample of this group comes from 17 animals, including six sheep and five goats and six ovicaprids. The sheep bones suggest a specimen slaughtered before 12–21 months, three between 3.5–6 years and two over 6 years. The goat material comes from one animal killed around 10–12 months, two between 1–2 years, one between 2–3 years and another between 4–6 years. Additionally bones from other six other individuals not specifically, killed as follows: two under 3 months, two between 6–12 months, and two between 3.5–6 years (Tab. 6). 34.56% of the ovicaprids remains come from the feet, 28.4% from categories C, D, only 9.88% from spine and 27.16% from skull. For now, the differences between the skeletal distributions of bones of the identified species have no particular significance. They are the result of a partial research of the site. In all species, skull fragments, isolated teeth, broken metapodia and phalanges are ubiquitous and widespread all over. Even in large species (cattle, horse, red deer), small fragments of long bones, isolated teeth, phalanxes predominate, the large remains being thrown elsewhere.

Twelve remains of the horse preserved, including three isolated teeth, an atlas, a rib, two carpal bones, and five fragments of parts of nutritional value: three fragments of a radius, an ulna, and an ilium. These originate in the skeletons of three specimens aged under 3–5 years, 3–5 years and 5–7.5 years. The four dog remains come from a large, wolf-like specimen and a smaller one. From the first specimen preserved a lower jaw with P1-M_3/ M_1 = 81/ 23 mm[25]. A lower molar/ M_1 with length of 17.5 mm and a canine were determined from a small dog. The canine in question has two cutting marks (Fig. 10/b).

[23] BĂEȘTEAN ET AL. 2017, 111.
[24] BĂIEȘTEAN ET AL. 2019, 160.
[25] Dahr basal length =191.

Among the hunted species we mention six hare bones of an adult (Table 6). Among the seven red deer remains, three are antler splinters and four metatarsal and skull fragments. Three medium phalanges were determined from the skeleton of an adult roe deer. A distal tibia with Bd/ Dd = 15/ 11 mm (recently broken) and a metapodium belong to fox. An incisor belongs to a beaver and a distal tibia (recently broken) to a marten (Bd/ Dd = 10.5/ 6.5 mm). A neurocranium, two mandibles, a femur and a tibia have been preserved from the skeleton of some rodents (mice). They are intrusive elements, probably of the same period, showing a similar pigmentation to other bones.

Post-Roman level

In some areas of the surveyed surface, traces of habitation were found shortly after the collapse of the Roman structures. In the vicinity of the building from the 3rd century AD, in the area of Sp. II, fragments of handmade vessels, metal recycling waste, but also fragments of bone and horn were found[26]. Thus, from a possible antler processing workshop, south of Z. 31[27], several pieces of red deer antlers and two bones from a pig aged 13–16 months, were collected. These are a vertebra, and a proximal phalanx recently fused. In Sp. II/ S5, inside one of the rooms of the building mentioned above, a late structure, erected after the decommissioning of the Roman wagon-type building, was identified. That consisted of a stone platform with a clay oven attached to it (Cx. 20). In addition to numerous Roman handmade sherds, animal bones were also discovered[28]. Four indeterminate (calcined) splinters, including a proximal metacarpus and a piglet milk incisor were collected. A pair of horse coxae were also found (Fig. 9/a). Fine cuts on the articular surface of the left acetabulum for removing the femoral head from the joint are visible. The pubic symphysis is not welded, nor the iliac crest, indicating a specimen aged below 4–5 years. The diameter of the acetabulum is 63 mm. The shape of the obturated hole, a longer ilium and a thinner pubis may suggest a mare pelvis. The pubic tubercle appears poorly developed.

357 animal bones from the post-Roman period were quantified, with 104 fully determined and 246 unidentified; a clam shell and six bones from the skeleton of some mice were also found (Tab. 2). 103 bones (99.4%) are from domestic mammals, the majority of which are small ruminants. The 36 ovicaprids bones are derived from ten specimens. Two were slaughtered between 3–6 months, one between 10–12 months, two between 1.5–2 years, four between 3.5/4–6 years, and one older. To mention a ram metatarsus with GL = 144 mm, suggesting a withers height of 67.39 cm (Țalkin). Their remains come in similar proportions from all body regions.

25 bones were assigned to at least five bovines, slaughtered at the following ages: under 2–2.5 years, 2–3 years, 3.5–4 years, 4–6.5 years and 6.5–9 years. Teeth and metapodial splinters are the most common among their remains. We determined 14 horse bones, including two dental fragments, two spine elements, four from feet and six from the fleshy parts of the limbs (scapula, ulna, femur, pelvis, and tibia) (Fig. 9). Taking into account the increased percentage of bones, it is highly probable the horse meat consumption.The remains come from four specimens with the following ages: little over 12–18 months (first phalanx recently fused), less than 3–5 years, between 3–5 years and above that limit.

Dynamics of species between levels.

So far, the early phase provided few bones for constructing a specific pattern of the economic and consumption activities of the villa's inhabitants. The 182 bones indicate that hunting

[26] BARBU ET AL. 2019a, 248.
[27] Dated at the end of the 3rd century AD.
[28] BARBU ET AL. 2019a, 254.

was not significant in terms of food. Elements of the surrounding wildlife were targeted: red deer, roe deer, beaver and others that cannot be named at this moment. Cattle, sheep, goats, and pigs were used for domestic purposes. The percentages on the remains of the three groups of mammals are similar, only the number of individuals shows certain differences. Cattle dominate as minimum number of individuals (MNI), followed by sheep and goats (22.22%) and pigs (16.66%). It's likely that the percentages will change when more samples will be collected. Since there are specimens of different ages, there is no discernible any pattern in the age profiles.

The analysis of the fauna from the levels II+III allows several suggestions about the economic model. As NISP, cattle prevail with 32.02%, then small ruminants with 28.43% and pigs with 26.47%. Dog bones make up 1.31% while horse bones 6.21%. As MNI, the small ruminants prevail with 29.51%, then cattle with 27.87% and pigs with 21.31% (Tab. 2). However, the differences between domestic taxa are too small to be meaningful. For the time being, it can be said that large and small ruminants were the most important than pigs. It is likely that, their growth was supported favorable ambient conditions. Along with providing meat and hides, cattle, sheep and goats were employed for milk, wool, hair, and traction power. It is possible horse meat using in some circumstances. Hunting was unimportant in terms of food, being practiced for leisure purposes, procurement of furs, hides, antlers. The game consisted of hare, roe deer, red deer, and various small carnivores. Roman sites often have a small percentage of wildlife that never exceeds 5%. Examples include: Oarda de Jos (*villa rustica*) – 1.52%[29], Suceag – 4% (rural settlement), Târnăvioara – 4% (rural settlement) Porolissum – 0.4–1% (buildings L7, LM3, tavern), etc [30].

We highlight the following details regarding the slaughter of the cattle: 37.5% of the presumed individuals were killed as adults or mature. Overall, 62.5% of their sample originate from juvenile and subadult specimens. It seems that, the residents of the villa mostly consumed veal. Metric data suggest that a significant proportion of body immatures used for flesh were bulls. A third of the stock was kept by-products.

In the case of sheep and goats, 44.43% are adults and mature kept for milk, wool, and breeding. In both juvenile and subadult stages, they appear to have been killed for meat, especially goats; sheep, apparently were also killed, but in lesser numbers. The number of culls in spring (under 3 months) is low (11.11%), but it rises after 8 months. Could it be some seasonal movements of the flock? Then, between two and three years, the stock was reduced by 44.46%.

Pig farming involved 36.36% slaughter before one year and the same up to two years. In the first year of life, sacrifices were made all year round without any discernible pattern. Breeding stock, or animals killed between 3–6 years and over 6 years makes up 27.27% of the presumed specimens. Turtles, clams, and other food sources were also used. For the moment, there is no evidence about fishing and the use of poultry meat.

The percentages of species in the post-Roman level differ from those in the Roman ones. According to the statistics, sheep and goats account for the largest proportion of MNI and NISP, about 34–37%. Pigs rank the second with 26–27%, while cattle the third with 18–24%. In comparison to Roman levels, the horse percentage triples and is around 13–15%. There are no dog bones in the level. From the wild species, only one red deer fragment was identified. No statistically significant difference between the number of species bones from phases 1 and 2+3 is shown by the Chi^2 test ($p = 0.89$)[31]. However, the proportion of horse bones between Roman and post-Roman levels shows statistically significant differences ($p = 0.04$). Concretely, they are more numerous in the post-Roman levels than in Roman levels (Tab. 8). Communities that

[29] Unpublished data.

[30] GUDEA ET AL. 2008, 43.

[31] Statistical processing was carried out using the PAST software and supporting documentation, cf. HAMMER 1999–2016, 78–79.

time may have eaten horse meat, raised more ruminants, and processed bones and antlers, many similarities to migratory communities.

Metric assessments

Few bones were measured due to advanced fragmentation. Excepting some fragments, the majority of cattle bones come from small-sized specimens (cows). However, some bones are larger: a distal humerus with Bt/ Bd/ Dd = 89/ 101/ 94 mm, a mandible with L M3 = 39; 41 mm, two distal tibiae with Bd/ Dd = 76/ 52 mm and 77/ 56 mm, so on…, all of them are noted in the measurements appendix with an asterisk. Perhaps, they are improved individuals, likely imported. I used the well-documented sites of Stolniceni[32] and Tác-Gorsium[33] for comparison. As the metric data becomes more extensive, the problem could be cleared up. Pig measurements show gracile individuals with high withers. Based on an astragalus with GL = 40 mm, a withers height of 73.9 cm was estimated, a normal value at that time[34].

In the case of goats there are some differentiations on the basis of which it is suggested that, there are medium-sized specimens with robust skeletons. From phase III, a *prisca*-type goat horn was identified. It is planconvex along the entire length, having the dimensions of the base of 31/ 22/ 98 mm. From the post-Roman period comes a sheep metatarsus with GL = 144 mm, estimated a waist of 67.39 cm (Ţalkin), a high value assigned to a ram. Close values were estimated for sheep from Roman sites in Transylvania: Micia, Porolissum-tavern, and Pater-Apulum Temple[35].

The metric data for horses are mostly from small specimens, less than 135 cm tall, by analogy with similar materials[36]. Two proximal phalanges of the following sizes are mentioned: GL/ Bp/ Sd/ Bd = 70/ 48.5/ 31/ 39.5 mm and GL/ Sd = 80/ 35 mm. The second bone has recently fused proximally, and belongs to a subadult. A proximal metacarpal (Fig. 9/b) has Bp/ Dp = 48.5/ 33 mm. Horses were probably multiple-use specimens, saddle or draft animals and meat source. As for canids, there were several different breeds in Roman times[37]. The two mandibular remains in our sample originate from two different specimens, one that is slightly smaller and the other that is larger and has a waist that is over 60 cm; the latter specimen was likely a guard animal.

In the study of the food and utilitarian economy of Roman and post-Roman habitations from Rapoltu Mare, the examination of the 1406 bones serves as a starting point for the time being. Preliminary data revealed that the animal economy was highly dependent on the goods offered by domestic animals during and after the functioning of the *villa*. The present article also suggested different animal husbandry strategies as well as models of their use. Rapoltu Mare served as a center for consumption, the animals kept on the estate likely have provided the majority of the meat and auxiliary items. This may also explain the high proportion of domestic species throughout the period, with no sustained contribution from game. Currently, there is also a lack of metric data, but there are indications for some local improvement concerns for cattle, sheep. As far as the post-Roman levels are concerned, some dietary preferences seem to be emerging, with greater emphasis on sheep and horses. Hopefully the new samples will (or won't) offer more evidence for the aforementioned ideas.

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32 UDRESCU 1979, 104–108.
33 BÖKÖNYI 1984, 128.
34 GUDEA 2002, tab. 14, 91.
35 GUDEA 2002, tab. 13, 91.
36 BÖKÖNYI 1984, 193–196
37 UDRESCU 1979, 108; GUDEA 2002, tab. 16, 92.

Table 1: Distribution of bones in Sp. I and Sp. II

Dating	**First half 2nd century AD**			**Late 2nd century**		**Phase 3/ 3rd century AD**		
Phases (Ph.)	Sp. I/ Ph. 1	Sp. II/ Ph. 1	Total Ph. 1	Sp. I/ Ph. 2	Sp. II/ Ph. 2	Sp. I	Sp. II	Total Ph. 3
Bos taurus (cattle)	13	7	20		2	8	88	96
Sus domesticus (pig)	2	17	19	1		2	78	80
Ovis/Capra (sheep/goat)	5	11	16	2	1	3	81	84
Equus caballus (horse)	3		3		1	6	12	18
Canis familiaris (dog)	1		1				4	4
Domestic mammals	**24**	**35**	**59**	**3**	**4**	**19**	**263**	**282**
Cervus elaphus (red deer)							4	4
Capreolus c. (roe deer)		1	1				3	3
Castor fiber (beaver)		1	1				1	1
Lepus sp. (hare)							6	6
Vulpes v. (fox)							2	2
Martes m. (marten)							1	1
Wild mammals		**2**	**2**				**17**	**17**
Determined mammals	24	37	61	3	4	19	280	299
Ribs		2	2		5	2	51	53
Splinters	28	84	112		9	29	446	475
Rodentia (rodents)		1	1			1	6	7
Antlers	1		1				3	3
Total mammals	53	124	177	3	18	51	786	837
Aves sp. (birds)		1	1				1	1
Rana sp. (frog)	1		1					
Emys orbicularis (tortoise)		2	2				1	1
Unio sp. (shells)		1	1			2	5	7
Total sample	54	128	182	3	18	53	793	846

Table 2: Species frequencies as number of fragments (NISP) and individuals (MNI) at Rapoltu Mare.

Dating	**Phase 1/ First half 2nd century AD**				**Phases 2–3/ Late 2nd – 3rd centuries**			
Species	NISP	%	MNI	%	NISP	%	MNI	%
Bos taurus (cattle)	20	32.78	6	33.33	98	32.02	17	27.87
Sus domesticus (pig)	19	31.15	3	16,66	81	26.47	13	21.31
Ovis/Capra (sheep-goat)	16	26.23	4	22.22	87	28.43	18	29.51
Equus caballus (horse)	3	4.92	2	11.11	19	6.21	**5**	8.2
Canis familiaris (dog)	1	1.64	1	5.56	4	1.31	1	1.64
Domestic mammals	**59**	**96.72**	**16**	**88.88**	**289**	**94.44**	**54**	**88.53**
Cervus elaphus (red deer)					4	1.31	1	1.64
Capreolus c. (roe deer)	1	1.64	1	5.56	3	0.98	1	1.64
Castor fiber (beaver)	1	1.64	1	5.56	1	0.33	1	1.64
Lepus sp. (hare)					6	1.96	2	3.27
Vulpes v. (fox)					2	0.65	1	1.64
Martes m. (marten)					1	0.33	1	1.64
Wild mammals	**2**	**3.28**	**2**	**11.12**	**17**	**5.56**	**7**	**11.47**
Determined mammals	61	100	18	100	306	100	61	100
Ribs	2				58			
Splinters	112				484			

Dating	Phase 1/ First half 2nd century AD				Phases 2–3/ Late 2nd – 3rd centuries			
Rodentia (rodents)	1				7			
Antlers	1				3			
Total mammals	177				858			
Aves sp. (birds)	1				1			
Rana sp. (frog)	1							
Emys orbicularis (tortoise)	2				1			
Unio sp. (shells)	1				7			
Total sample	182				867			

Continued

Epoch	Total roman epoch				Postroman			
Species	NISP	%	MNI	%	NISP	%	MNI	%
Bos taurus (cattle)	118	32.15	23	29.11	25	24.04	5	18.52
Sus domesticus (pig)	100	27.25	16	20.25	28	26.92	7	25.93
Ovis/Capra (sheep-goat)	103	28.07	22	27.85	36	34.62	10	37.04
Equus caballus (horse)	22	5.99	7	8.86	14	13.46	4	14.81
Canis familiaris (dog)	5	1.36	2	2.53				
Domestic mammals	**348**	**94.82**	**70**	**88.6**	**103**	**99.4**	**26**	**96.3**
Cervus elaphus (red deer)	4	1.09	1	1.27	1	1	1	3.7
Capreolus c. (roe deer)	4	1.09	2	2.53				
Castor fiber (beaver)	2	0.55	2	2.53				
Lepus sp. (hare)	6	1.63	2	2.53				
Vulpes v. (fox)	2	0.55	1	1.27				
Martes m. (marten)	1	0.27	1	1.27				
Wild mammals	**19**	**5.18**	**9**	**11.4**	**1**	**0.96**	**1**	**3.7**
Determined mammals	367	100	79	100	104	100	27	100
Ribs	60				10			
Splinters	596				236			
Rodentia (rodents)	8				6			
Antlers	4							
Total mammals	1,035				356			
Aves sp. (birds)	2							
Rana sp. (frog)	1							
Emys orbicularis (tortoise)	3							
Unio sp. (shells)	8				1			
Total sample	1,049				357			

Table 3: Distribution of the bones from the 1st–2nd phases by body regions

Phases	Sp. I – Phase 1st					Sp. II – Phase 2nd		
Elements	*Cattle*	*Pig*	*Sheep/g*	*Horse*	*Dog*	*Cattle*	*Pig*	*Sheep/g*
Neurocraniu/ ossa corni						1		1
Viscerocranium.		1					2	
Dentes super.							1	1
Mandibula	2		1				1	1
Dentes infer.		1		1		1	1	
Atlas								
Axis								

Phases	**Sp. I – Phase 1st**					**Sp. II – Phase 2nd**		
Vertebrae	3						3	
Costae							3	2
Scapula					1			1
Humerus	2		1			1	1	
Radius	1		1	1		1	1	
Ulna				1			1	
Metacarpus	1							
Carpalia								
Pelvis			1				1	
Femur	1					1	1	1
Tibia	1							
Talus								
Calcaneus								1
Metatarsus	1						1	1
Tarsalia	1							1
Phalanx 1								1
Phalanx 2						2		
Phalanx 3								
Metapodalia			1					
Total	13	2	5	3	1	7	17	11

Continued

Phases	**Sp. II – Phase 1st**		**Sp. I – Phase 2nd**		**Sp. II – /Phase 2nd**		
Elements	*Roe deer*	*Beaver*	*Pig*	*Sheep/g*	*Cattle*	*Sheep/g*	*Horse*
Neurocraniu/ ossa corni			1				
Viscerocr.							
Dentes sup.							
Mandibula							1
Dentes inf.							
Atlas							
Axis							
Vertebrae							
Costae				2	1		
Scapula							
Humerus							
Radius							
Ulna							
Metacarpus							
Carpalia							
Pelvis							
Femur						1	
Tibia							
Talus							
Calcaneus							
Metatarsus					1		
Tarsalia							
Phalanx 1							
Phalanx 2							

Phases	**Sp. II – Phase 1st**		**Sp. I – Phase 2nd**		**Sp. II – /Phase 2nd**		
Phalanx 3		1					
Metapodalia	1						
Total	1	1	1	2	2	1	1

Table 4: Distribution of the bones from the 3rd phase by body regions

Phases	**Sp. I/ Phase 3 – 3rd century AD**				**Sp. II / Phase 3 – 3rd century AD**		
Elements	*Cattle*	*Pig*	*Sheep/g*	*Horse*	*Cattle*	*Pig*	*Sheep/g*
Neurocraniu/ ossa corni			1		3	2	1
Viscerocr.					1	5	2
Dentes sup.	1				3	2	6
Mandibula					8	6	3
Dentes inf.				1	7	2	10
Atlas						2	
Axis						1	
Vertebrae	1			1	5	4	1
Costae				1	12	13	7
Scapula					8	7	1
Humerus				1		4	3
Radius					3	1	9
Ulna				1	2	4	1
Metacarpus	1		1		1		3
Carpalia					1		
Pelvis					2	6	1
Femur	1			1	2	4	2
Tibia	2	1			8	5	6
Talus		1			3	1	
Calcaneus					1		
Metatarsus	1				4	1	3
Tarsalia							3
Phalanx 1					5	3	9
Phalanx 2	1				6	3	8
Phalanx 3					2	2	2
Metapodalia			1		1		
Total	8	2	3	6	88	78	81

Continued

Phases	**Sp. II / Phase 3 – 3rd century AD**							
Elements	*Horse*	*Dog*	*Red deer*	*Roe deer*	*Beaver*	*Hare*	*Fox*	*Marten*
Neurocraniu/ ossa corni			1					
Viscerocr.	1							
Dentes sup.			1					
Mandibula		1						
Dentes inf.	2	2						
Atlas	1							
Axis								
Vertebrae								
Costae	1					1		

Phases	**Sp. II / Phase 3 – 3rd century AD**							
Scapula								
Humerus								
Radius	3					1		
Ulna	1					1		
Metacarpus								
Carpalia	1							
Pelvis	1							
Femur					1			
Tibia						1	1	1
Talus						1		
Calcaneus								
Metatarsus			2					
Tarsalia								
Phalanx 1								
Phalanx 2	1			3				
Phalanx 3								
Metapodalia		1				1	1	
Total	12	4	4	3	1	6	2	1

Table 5: Cattle slaughter profiles

Phases	**Ph. 1**		**Ph. 2**	**Ph. 3**		**Phases 2+3**		**Post roman**	**Stage**
Age	Sp. I	Sp. II	Sp. I	Sp. I	Sp. II	Total	%	Total	
< 24–30	1				2	2	12.5	1	juvenile
24–36 m				1	4	5	31.25	1	subadulte
3–3,5 y					1	1	6.25		
<3,5–4 y	1	1			2	2	12.5		
3,5–4 y	1				1	1	6.25	1	adult
>3–4 y	1								
4–6,5 y					1	1	6.25	1	
6,5–9 y				1	1	2	12.5	1	
9–11,5 y					1	1	6.25		mature-senile
>11,5 y		1			1	1	6.25		
Total	4	2	1	2	14	16	100	5	
Age?			1			1			

Table 6: Sheep/ goat slaughter profiles

Phases	**Ph. 1**		**Ph. 2**	**Ph. 3**		**Ph. 2+3**		**Post roman**		**Stages**
Age (months)	Sp. I	Sp. II	Sp. I	Sp. I	Sp. II	Total	%	Total	%	
0–3 m					2	2	11.11			infans
3–6 m								2	20	juvenile
<7–10 m		1			1	1	5.56			
8–10 m					1	1	5.56			
10–12 m	1				1	1	5.56	1	10	
12–14 m		1			1	1	5.56			
18–24 m					2	2	11.11	2	20	subadult
2–3.5 y			1		1	2	11.11			
3.5–6 y		1			6	6	33.32	4	40	adult
>6 years					2	2	11.11	1	10	mature

Phases	Ph. 1		Ph. 2	Ph. 3		Ph. 2+3		Post roman		Stages
Total	1	3	1		17	18	100	10	100	
Age?				1						

Table 7: Pigs slaughter profiles

Phases	Ph. 1		Ph. 2	Ph. 3		Ph. 2+3	Post roman	Stage
Age	Sp. I	Sp. II	Sp. I	Sp. I	Sp. II	Total%		
0–3 m					1	9.09	2	infans
3–6 m					1	9.09		
6–8 m					1	9.09		juvenile
8–10 m					1	9.09		
12–14 m					1	9.09	1	
14–18 m	1	1			2	18.18	1	subadult
18–24 m					1	9.09	2	
24–36 m								
3–6 y		1			1	9.09	1	adult
>6 y					2	18.18		mature
TOTAL	1	2			11	100	7	
Age?			1	1				

Table 8: Chi2 values

	Phase 1		Phases 2+3	
Values	observed	expected	observed	expected
Cattle	20	20	98	98
Pig	19	17	81	83
Shep/g	16	17	87	86
Horse	3	4	19	18
Chi^2:	0,61763	p=0,89	df–3	
	Roman, Ph. 1–3		Post roman	
Cattle	118	110	25	33
Pig	100	98	28	30
Shep/g	103	107	36	32
Horse	**22**	**28**	**14**	**8**
Chi^2:	8,3151	p=0,039	df–3	

MEASUREMENTS

Horn cores

Level	OC	BA	BB	BC	Taxon
Roman	130	31	22	98	F/ Goat

Mandibula

Level	P1-M3	M1-M3	M3/M1	Taxon
Roman			17,5	Dog
Roman	81	39	23	Dog
Roman			20	Sheep
Roman		91	39	Cattle*
Roman			41	Cattle*
Roman			29	Horse
Postroman	72,5	49	23,5	Goat

Scapula

Level	SLC	GLP	LG	Taxon
Roman		83,5	68,5	Cattle
Roman		78	64	Cattle
Roman	22	36	28	Pig
Roman	23	35,5	31	Pig
Roman	28			Pig
Roman	26	31	26,5	Dog
Postroman		57	48	Horse

Femur

Level	Bd	Taxon
Postroman	84	Horse

Humerus

Level	BT	Bd	Dd	Taxon
Roman	89	101	94	Cattle*
Roman	33	39	36	Pig
Roman	28	27		Goat
Roman	31	33		Goat
Postroman	29			Sheep

Radius

Level	BFp	Dp	BFd/Bd	Dd	Taxon
Roman	47,5				Cattle
Roman	72	43			Horse
Roman			61/72	42	Horse

Metacarpus

Level	Bd	Dd	Taxon
Roman	57	31	Cattle
Roman	60	33	Cattle
Roman	28	18	Goat
Roman	29	17	Goat
Roman	29,5	18	Goat
Postroman	48,5	33	Horse

Ph II

Level	Gl	Bp	Taxon
Roman	44	33,5	Cattle
Roman	44	34	Cattle
Roman	44	35	Cattle
Roman	47	36	Cattle*

Metatarsus

Level	GL/ Bp	Dp	Bd	Dd	Taxon
Roman			57	31,5	Cattle
Roman			54	31	Cattle
Roman			27,5	17,5	Goat
Postroman	144/23	22,5	26,5	18,5	Sheep

Tibia

Level	Bd	Dd	Taxon
Roman	76	52	Cattle*
Roman	77,5	56	Cattle*
Roman	27	23	Goat
Roman	30	22	Goat
Roman	15	11	Fox
Roman	10,5	6,5	Marten

Ph I

Level	Gl	Bp	Taxon
Roman	56	25	Cattle
Roman	66,5	33,5	Cattle
Roman	69	34,5	Cattle*
Roman		36	Cattle
Roman	35	15,5	Pig
Postroman	63	30,5	Cattle

Talus

Level	GLl	GLm	Bd	Taxon
Roman	40	37	23	Pig
Roman	68		40	Cattle

Acetabulum

Level	LA	Taxon
Roman	26	Pig
Roman	63,5	Horse
Postroman	63	Horse

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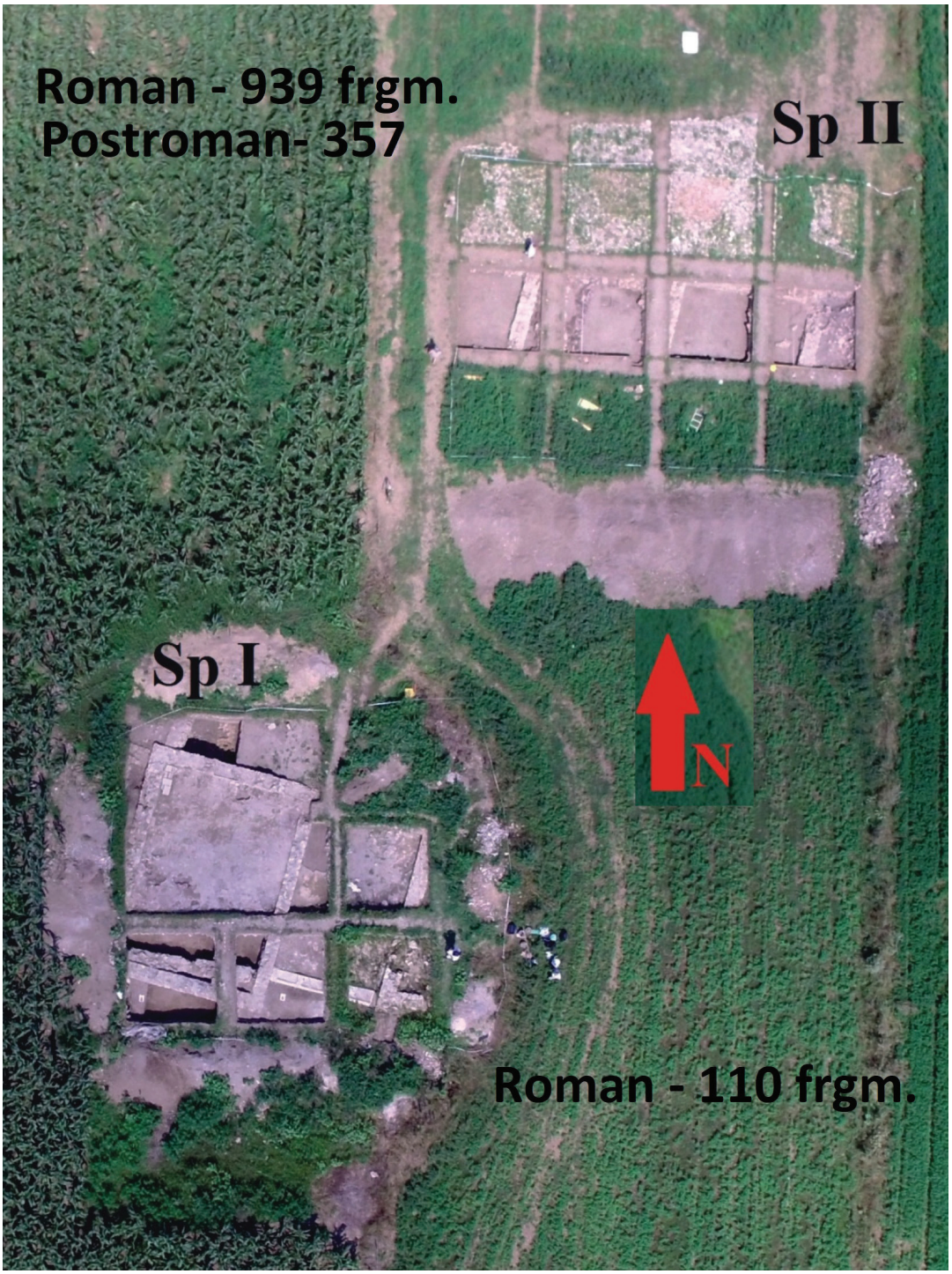

Fig. 1. Spatial distribution of the bones in the two investigated areas at Rapoltu Mare, apud BARBU ET AL. 2019a, fig. 2.

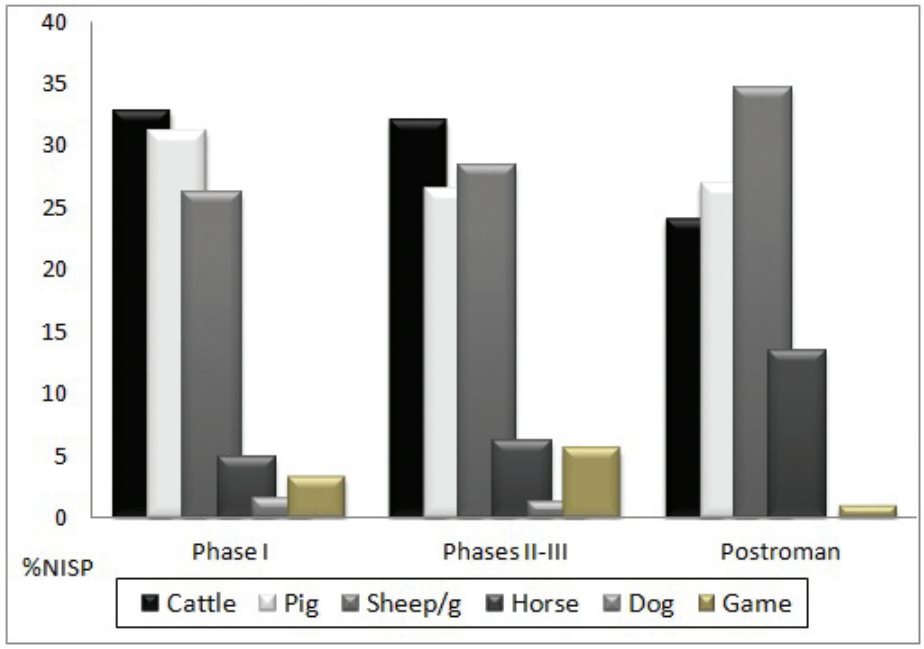

Fig. 2. Species frequencies as NISP in the levels from Rapoltu Mare.

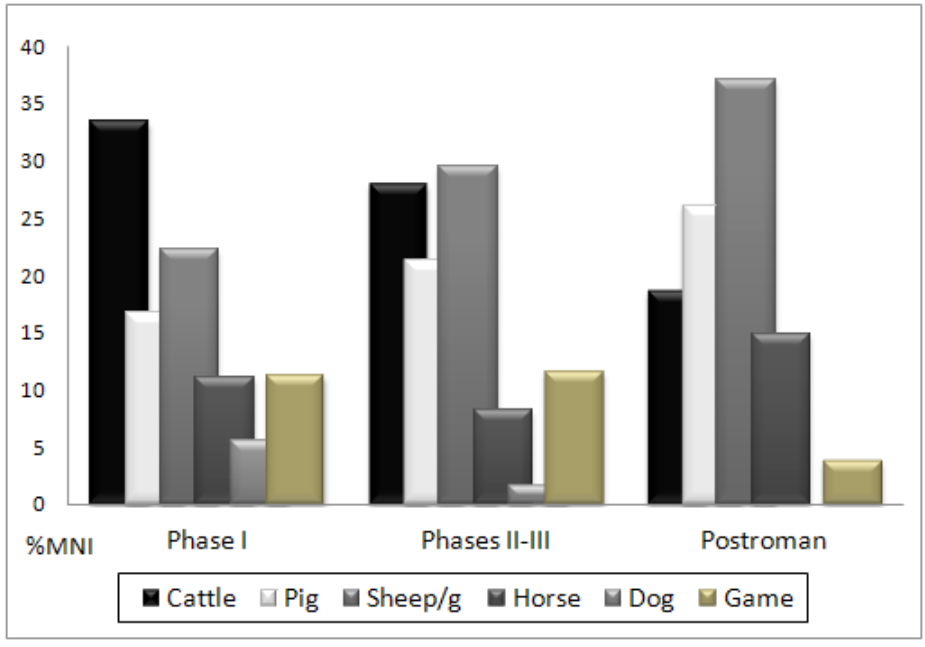

Fig. 3. Species frequencies as MNI in the levels from Rapoltu Mare.

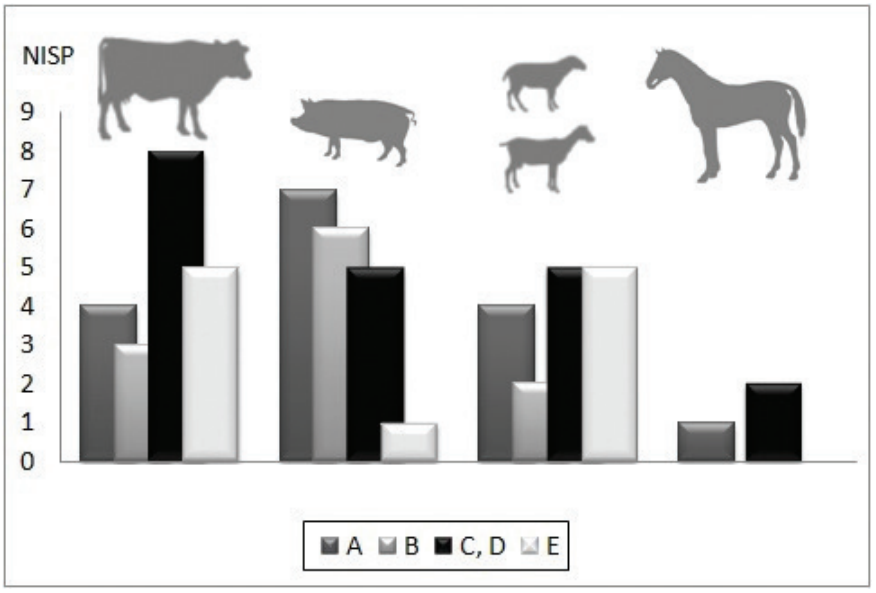

Fig. 4. Distribution of the bones from the 1st phase by body regions at Rapoltu Mare.

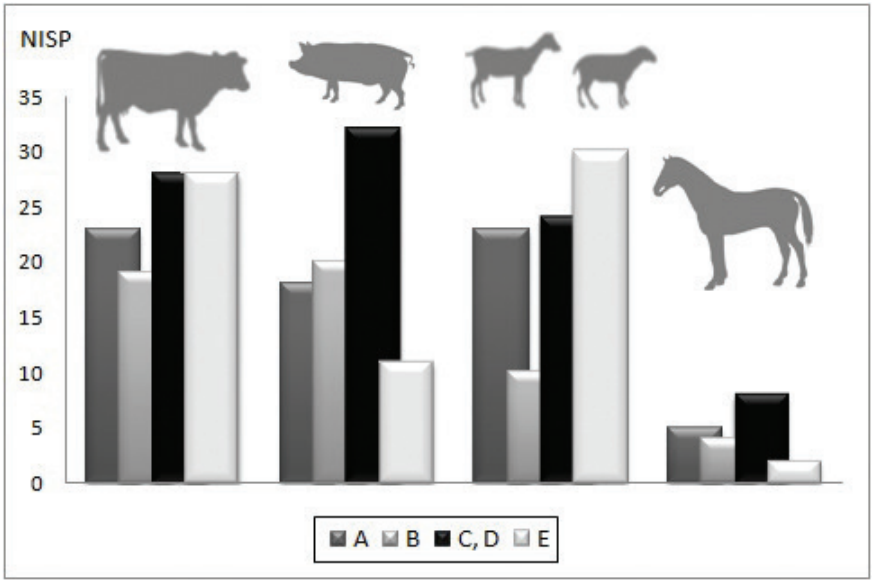

Fig. 5: Distribution of the bones from the 2nd–3rd phases by body regions at Rapoltu Mare.

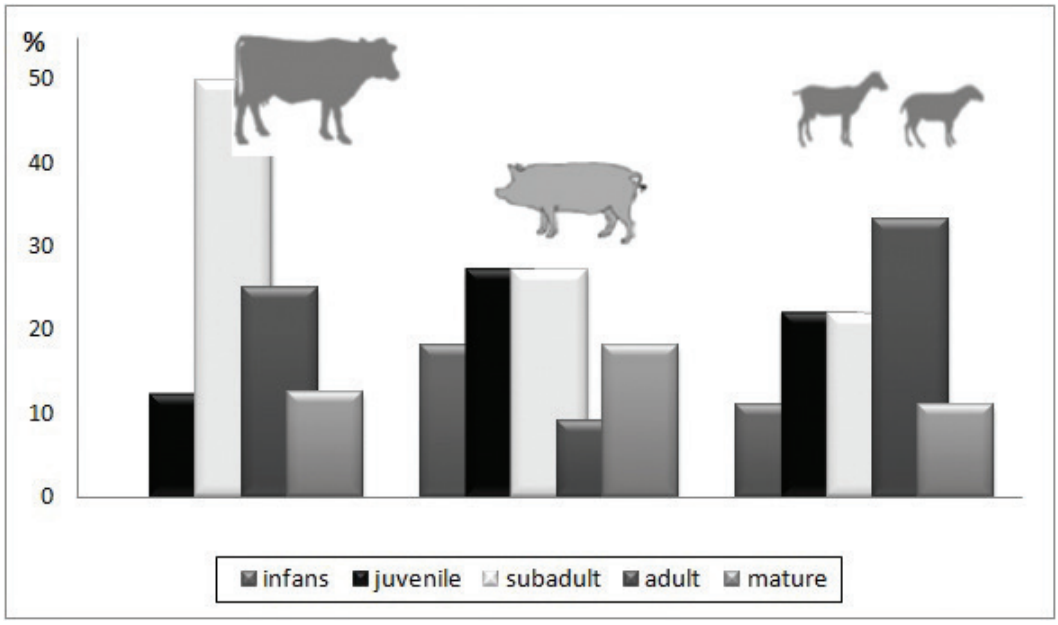

Fig. 6. Age profiles of cattle, sheep, goat and pig in the 1st phase at Rapoltu Mare.

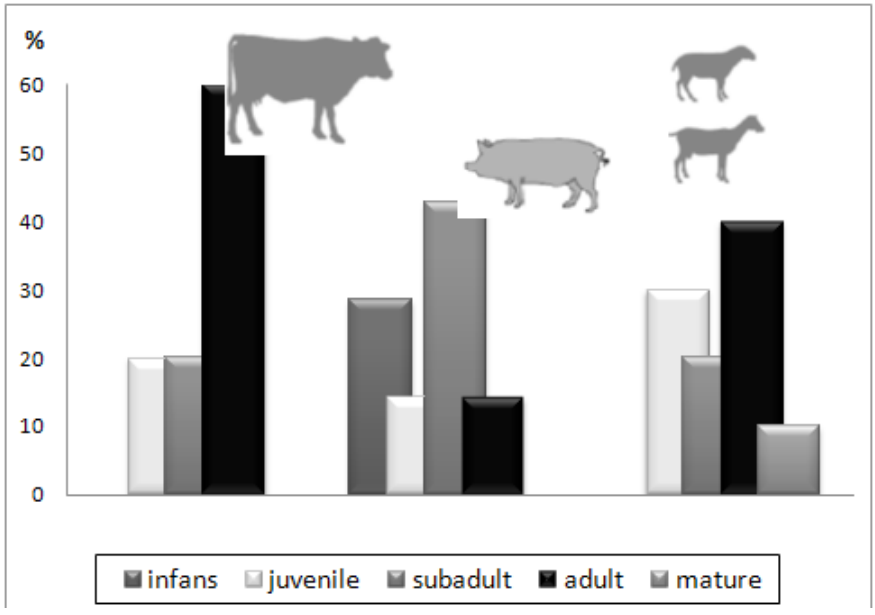

Fig. 7. Age profiles of cattle, sheep, goat and pig in the 3rd phase at Rapoltu Mare.

Fig. 8. Bones with cutting marks from Rapoltu Mare.

Fig. 9. Horse bones from Rapoltu Mare: a – Equine pelvis, ventral view; b-proximal metacarpus; c- proximal falanx; d-distal femurus, e-scapula.

Fig. 10. Pieces with wear (a-cattle metacarpal) and cutting marks (b- cattle proximal phalanx; c-dog canine) from Rapoltu Mare.