Faunal remains from the Early Iron Age rock-cut complex
Gluhite Kamani (Eastern Rhodopes, Bulgaria)

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Abstract: The faunal remains recovered from the Gluhite Kamani site offer the unique opportunity to explore the consumption patterns of the Early Iron Age communities inhabiting the Rhodope Mountains. While a lot high-altitude and rock-cut sanctuaries have been registered within the Rhodope Mountains, this is the only site yielding a larger assemblage (n = 3160) from a stratigraphic sequence dating to the Late Bronze Age – Early Iron Age transition and the Early Iron Age. Domestic animals dominate, with sheep/goat being the main exploited species through all stratigraphic layers. The results show that the percentage of represented domestic animals is relatively continuous, while the number of wild animals seems to vary throughout the different periods. As the site is regarded as a sanctuary during the Iron age, the extent to which we can identify any ritual activity from the osteological assemblage is commented on in the discussion regarding the cull patterns observed, and taphonomy.

Keywords: archaeology, Early Iron Age, faunal analysis, Mediterranean, taphonomy, zooarchaeology

The site

Gluhite Kamani is an archaeological site located on the north-eastern ridge of the Rhodope Mountains chain. The site is situated on the south-eastern slope of the Sveta Marina Peak. Archaeological excavations – which started in 2008 – have shown that the site was occupied from the final phase of the Late Chalcolithic (First half of the 4th mil. BCE) to the medieval period, with the densest stratigraphic layers belonging to the Early Iron Age.

Current understanding of the site’s range, plan, stratigraphic sequence and chronology has been garnered through fifteen years of on-going archaeological research, which yielded marvellous results. Through this it can be stated that the site functioned as a cult complex with a rich history throughout the centuries. The centre of cult activity seems to be the most elevated point, on which the ruins of a medieval church can be seen to this very day. It is most likely that an earlier pagan sanctuary functioned on the same spot, which would explain the accumulation of dense debris layers of the central, southern, and northern sectors, which contain the remains of sacrificial feasts and offering. The sanctuary continued to function during the Roman period, proof of which is the fragment of a marble votive plaque, several coins and pottery sherds. However, the deity which was worshiped is still unknown. Sometime during the 4th – 5th century a Christian church was constructed on top of the ancient ruins, which shows the sought continuity. The church, a basilica, continued its existence into the medieval period, with some small reconstructions. During this period a second, larger
basilica was established on the southern slope. A large stone wall was constructed to protect this very important complex.

The site stopped functioning in the beginning of the 13th century and its demise can be linked to the knights of the 4th Crusade, who passed through these lands.

This study focuses on the recovered faunal remains during the excavation campaigns of 2015–2021 (Fig. 1).

Geographic setting

The site is located in South-eastern Bulgaria, on the north-eastern ridge of the Rhodope Mountains, laying beneath the Sveta Marina (St. Marina) Peak (708.6 m), one of the highest reaches of the ridge “Gorata”. The site’s name translates to “the Deaf Stones”, referring to the lack of echo among the rhyolite rock formations surrounding the site. The southern slope of the Sveta Marina Peak consists of several groups of rocks, divided by geological faults. The “Gorata” Ridge is the watershed of the Martisa and Arda rivers. The northern slopes descend into the right tributaries of the Martisa, while the southern merge with the Arda. The terrain has a dense vegetation cover consisting of oak forests.

Chronology

Archaeological research on the site has been ongoing since 2008. The excavations have been carried out in five distinct sectors by two teams. The Central sector has provided the best opportunity to explore the site’s stratigraphy, as the cultural layer is well preserved to a maximum height of 3 metres (Nekhrizov & Tsvetkova, 2018). Seven phases have been distinguished based on the stratigraphic sequence. The earliest (GK I) dates to the final Chalcolithic period (around the second quarter of the 4 mil. BCE). GK II belongs to the transition period from the Late Bronze (LBA) to the Early Iron Age (EIA) (12th cent. BCE). GK III encompasses the first phase of the Early Iron Age (11-10th up until the beginning of the 9th cent. BCE). The next phase, GK IV is attributed to the second period of the Early Iron Age (9 – 6th cent. BCE). Based on the presence of grey monochromic ware and coins, the GK V is dated to the Late Classical – Early Hellenistic period (Late 5th – 4th cent. BCE) (Table 1). The next chronological phases
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Table 1. Chronology of rock-cut complex Gluhite Kamani by archaeological periods.

<table>
<thead>
<tr>
<th>Stratigraphic layer name</th>
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<tr>
<td>Gluhite Kamani II (GK II)</td>
<td>Late Bronze Age – Early Iron Age transition</td>
</tr>
<tr>
<td>Gluhite Kamani III (GK III)</td>
<td>Early Iron Age first phase</td>
</tr>
<tr>
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<td>Early Iron Age second phase</td>
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Faunal material was analysed using the reference collection in the Laboratory of Archaeozoology in the National Museum of Natural History – BAS. Measurements of the bones were taken (in mm) by the method of von den Driesch (1976). Due to the high fragmentation rates, 169 elements could be measured from the whole assemblage. Metapodials, phalanges and tali are the only bones that yielded a preserved greatest length. Since the quantity of measurable elements is low, the metric data are given as raw values in the appendix and cannot be used to conduct any statistical comparisons (Supplementary material 01 [.xlsx]). The fragmentation obstructed the identification of most of the elements from sheep and goat, therefore, in this paper, the term “sheep/goat” will be used for sheep/goat unidentifiable bones. The material was gathered from only one sector of the site, which gives a statistically significant sample, but it must be kept in mind that it may not be representative of the whole site.

Materials and methods

In this study, the faunal remains from the Central sector were examined, with the most significant and richest remains in the cultural layers. The material is from three periods – LBA/EIA (GKII), EIA (GK III) and EIA second period (GKIV). The animal remains from the site were first examined by Assoc. Prof. L. Ninov (NAIM – BAS) who worked on the campaigns from 2010 to 2014. He recorded 1800 faunal remains from the same sector, and the faunal ratios from his unpublished reports overlap with our results.

A total of 3160 faunal remains were registered in these layers and features. About 99.6% of the osteological material is mammalian, with a meagre quantity of reptiles, fish and birds (Table 2). From the examined material, 1828 remains are identifiable to species and families. Due to the very high fragmentation of the bones, the unidentifiable splinters are separated into three groups: large sized mammals (cattle/deer/horse sized), medium sized mammals (pig, sheep/goat, and roe deer) and small sized mammals (dog, fox, hare, and cat) (Supplementary material 02 [.xlsx]).

GK VI and GK VII (Late Antiquity and medieval period), cannot be accurately distinguished within the available stratigraphic layers and contain no archaeological features in this sector. However, materials from the Early Byzantine and medieval periods are abundant among in the other sectors (Nekhrizov & Tsvetkova, 2018). None of the other sectors – Church 1, Northern, Western and Southern contains all seven phases, and the intensity of their occupation seems to have varied considerably. Therefore, the subject of this article is the osteological material from the Central sector and phases GK II – GK IV, from the LBA – EIA transition, till the end of the EIA.

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The number of identified specimens (NISP) is used for quantitative techniques in species identification. Using the diagnostic zone recording for long bones (Dobney & Rielly, 1988), the percentage of completeness of each bone element was calculated. This calculation was made using the method developed by Morlan (1994) with the following formula: Total diagnostic zone counts per element/total number of defined zones in the element = percentage of fragmentation. The percentage of completeness is a good unit to apply when measuring the general fragmentation of the assemblage – the lower the percentage, the higher the fragmentation. For analysis of the traces on the bone’s surfaces – butchering marks and cooking/burning the methods follow Binford (1981) and Nicholson (1993).

The cattle breeds are reconstructed based on the method of Iliev (1994). In his study, he defines three main types of breeds according to the dimensions of the bones and withers’ height. These conditional breeds are the primigenious (big size cattle), the crossbreed...
(medium size cattle) and the short horn breed (small size cattle).

Cull patterns (age of death) of the sheep/goat are calculated using the summarised information from the data of teeth eruption/wearing stages following Payne (1973) and epiphysis fusion stages by Moran & O’Connor (1994). The studies of Schmid (1972) and Grant (1975) are used for cattle and pigs. They are combined because the teeth and mandibles from this material alone do not make a statistically significant sample. The age classes are grouped into four categories: infant, juvenile, subadult and adult. The age in months of these categories depends on the domestic animals (Forest, 1997).

### Results

A total of 1828 faunal remains were identified on the site. Domestic animals dominate all taxa, representing about 90% of the material (Supplementary material 03 [.xlsx]). From them, the sheep/goat (47.64%) are most abundant, followed by the domestic pig (24.50%) and cattle (16.44%). There are only a few bones from dog, horse and donkey. Wild animals make up 11% of all material. Although their percentage is low, there is a high species diversity. Most remains are from red deer, but there are also small amounts of bones from fallow deer, roe deer, wild boar, red fox, European hare, Eurasian beaver, partridge, tortoise and fish (Fig. 2). The species composition ratio of domestic animals is stable throughout all chronological phases, with very little variance (Fig. 3).

**Sheep/goat (Ovis aries/Capra hircus L.)**

Sheep/goat are the site’s most abundant animal from all periods, with 884 remains. The high fragmentation of the bones and young age does not allow correct identification of most bones. Only 63 elements are identified as goats and 39 – as sheep. Almost all elements from the skeleton of the animals are present.

### Table 2. Count of faunal remains found on the site by classes.

<table>
<thead>
<tr>
<th>Class</th>
<th>NISP</th>
<th>NISP%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammalia</td>
<td>3146</td>
<td>99.63%</td>
</tr>
<tr>
<td>Aves</td>
<td>2</td>
<td>0.05%</td>
</tr>
<tr>
<td>Reptilia</td>
<td>10</td>
<td>0.26%</td>
</tr>
<tr>
<td>Actinopterygii</td>
<td>2</td>
<td>0.05%</td>
</tr>
<tr>
<td>Total</td>
<td>3160</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Fig. 2. Quotative ratio (in percentage) of the wild and domestic animals found in Gluhite Kamani.
The fragments from horn cores belong to goats; only one is from a sheep. The possible explanation of the small amount of horn cores is the presence of hornless sheep in the populations.

Cull patterns on the site according to the age of death exhibit a bimodal distribution of adult and juvenile individuals in all stratigraphic layers. This profile corresponds to the milk production profile. Still,
the small quantity means that restraint is necessary regarding making general conclusions (Fig. 4). However, the site’s ritual function may suggest the consumption of the animals in specific periods. Typically, sheep/goat give birth from the end of February until the end of March. The presence of juveniles between 3 and 12 months and infants from 0 to 3 months suggests at least two consumption events took place on the site. One in the spring, May/June, and one in September/October. The large amount of animal remains from adult individuals shows that they were also consumed alongside the young animals. The small number of infant and subadult animals suggest that they were not preferred for consumption and probably are exceptions (as young animals do not yield much meat, but must also consider that their remains are highly prone to deterioration and may not have preserved).

Cattle (*Bos taurus* L.)

Cattle make up a total of 16.44% (n=314) of all material. The percentage is almost constant in the analysed stratigraphic sequences. They come in third in the category of husbandry animals, suggesting they were not the preferred animals for consumption. The small number of bones and high fragmentation rate do not allow for statistical and comprehensive metric analysis of the cattle remains.

There are only a few metapodials which allow measurements. Their size in proximal and distal end breaths show individuals larger than brachiceros breed characteristic for the region in Rhodope Mountains – Rhodopean shorthorn cattle (Table 3). Their dimensions fall in the ranges of the primigenius type of breeds after Iliev (1994).

The age of death of the animals shows a preference towards adult individuals, but juveniles are also present in all strata. Only a few bones belonging to subadults and infants are reported in layers GK III and GK IV (Fig. 5).

Domestic pig (*Sus domesticus* L.)

The domestic pig is the second most abundant animal after the sheep/goat. A total of 449 remains were identified, which make up about 25% of the fauna. They maintain a stable percentage throughout all layers. The material is highly fragmented; the only preserved complete elements are the phalanges and tarsal bones.

The age of death shows that juvenile (between 6–15 months) and subadult animals (between 15 months and 2.5 years) were preferred for consumption. The infants and adults are present in all layers; but they are scarce. (Fig. 6).

Horse and donkey

(*Equus caballus* L.), (*Equus asinus* L.)

A total of 12 fragments from horses were identified on the site. Almost all remains come from the GK III and GK IV layers and are distributed equally. The fragments belong to the legs of the animals, mandibles and teeth. In GK III, there are parts of the metapodia, tarsal bones, and some loose teeth, while in GK IV, they are mainly from the head and pelvic bones. The
only bone from GK II is a shaft fragment from a tibia, which was burnt at a very high temperature (cremated). The other remains were also exposed to the fire according to the black spots and grey colour.

Six fragments were identified as belonging to a donkey based on their small size. They consist of mainly metacarpals and metatarsal bone fragments, except one part of a humerus from GK II and an upper
molar from GK IV. Only two metapodials have traces of burning.

The humerus fragment from GK II is among the earliest identified domestic donkey bones from Bulgaria. The only other reported donkey bone comes from a Late Bronze-Early Iron age transitional context, from the site of Vratitsa (Burgas Region), but it was mentioned briefly without the exact date (Ribarov & Ribarova, 2015: 260). The earliest donkey remains in the Mediterranean were discovered at the site of Lerna, Peloponnesse, where they first appear in the Early Helladic II layers (22700–2450 BCE) (Gejvall, 1969: 35). Closer to the Balkans they are rare in Late Bronze assemblages, but non the less present. There is a small third phalanx, determined to be of a donkey dating to the Late Bronze Age layer (1750–1300 BCE), from the site of Troy, located at the Gallipoli Peninsula (Gejvall, 1939) and in Kastanas, Macedonia, where they appear in the Middle Bronze Age layers (Becker, 1986: 87). While, we have only one specimen that can be attributed to the Late bronze age layers, and the bone has not been carbon dated, it is possible to expect that these animals did spread into the southern parts of the Balkans. It is interesting to note that while assemblages from the Bronze age have been examined closely in Romania, donkeys seem to appear in the Late Iron age (6th century BCE) for the first time (Balasescu et al., 2003), but the lack of published Late Bronze – Early Iron age faunal assemblages from Bulgaria, restricts us to trace their spread.

Dog (*Canis familiaris* L.)

There are only ten remains from dogs found on the site. From GK I, we have a fragment from the calcaneus. Four vertebrae, a femur and a tibia come from the GK II layer. In GK III, we have fragments from the skull, humerus, ulna and a complete metatarsal bone. The humerus belongs to a young individual under six months. GK IV has only two fragments – from an axis and tibia. Almost all remains have black spots indicating burning or some fire treatment.

Wild animals

The wild taxa encompass mainly mammals: red (*Cervus elaphus* L.), fallow (*Dama dama* L.) and roe deer (*Capreolus capreolus* L.), wild boar (*Sus scrofa* L.), red fox (*Vulpes vulpes* L.), Eurasian beaver (*Castor fiber* L.) and European hare (*Lepus europaeus* Pallas, 1778). There are also some remains from partridge, fish and tortoise. Wild animals make up 11% of all material (NISP 145) which is a relatively high percentage (see the discussion) (Supplementary material 03 [xltx]| Supplementary material 03 [xltx]). There is a significant diversity in species, and it can be attributed to the specific region. Unlike domestic animals, where the percentage is almost the same in every layer, the ratio of wild animals tends to vary in the different stratigraphic layers. The highest percentage of wild animals is in layers – GK II and GK III, where the red deer dominates. The remains from fallow, roe deer and wild boar are almost the same quantity. A few remains from red fox, hare, fish and tortoise are also present in layer GK II. The red deer and wild boar are the most abundant in GK III. Fallow, roe deer, hare and tortoise maintain the same percentage as in the earlier layer. In GK IV, wild taxa decline in number; the most abundant animal is the roe deer. Remains from red deer, wild boar and hare are almost equal. There are a few bones from a red fox and one from a partridge (Fig.7).

This ratio suggests some changes in the hunting preference. LBA/EIA period (GK II and III), the most preferred wild animal is the red deer, but in the second phase of the EIA period, roe deer and hares become the most abundant game animals. These can be caused by local climate changes or some cultural change.

These animals are typical for this habitat. A total of 55 remains from red deer were identified. Most consist of parts of the legs, with only four fragments belonging to antlers. The most numerous are the remains in GK II. Only ten bones belong to fallow deer in GK II/III. Roe deer is in second place as quantity (NISP 29), with the highest number of elements in GK IV. Wild boar is one of the main game animals with 25 fragments from bones and teeth. From the red fox, only one mandibula was found close to the fireplaces and metacarpal bones over the stone cluster. There is one mandible from the Eurasian beaver, which was found in GK II. Probably the fox and beaver were not consumed but used as pelts, as there are no traces of butchering. There are 16 remains from European hares, primarily parts of the pelvic and long bones. Most of the bones were found in GK IV, where the hare is the second most abundant wild animal. From the tortoise, only fragments from the shell were present. We cannot be certain if the tortoises are part of the archaeological material or if they were a recent intrusion, as the hibernation of these
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animals requires digging into the ground. Only one bone from fish, a premaxilla of a Cyprinidae sp., was found in layer GK IV. The bone is large, and the fish was most probably a catch from one of the big rivers nearby (the Arda or Maritsa), which shows that at least some of the meat types were brought from the wider geographical surroundings.

Bone fragmentation and preservation

The material is highly fragmented throughout all stratigraphic layers, with long bones having an average of 20% preservation. This contrasts smaller and more compact bone element (phalanges (PH), carpal and tarsal bones), mainly discovered intact. There is slight variation in the preservation rates between stratigraphic layers and individual species, except for a higher preservation rate of ulna, radius and metatarsals of bovines in stratigraphic layer GK III. The highly fragmented long bone and the mandibular pattern are consistent with marrow extraction, as some elements bear the typical breakage ridges (Fig. 8). Secondary fragmentation seems to have occurred through exposure to the physical surroundings, as all layers seem to have accumulated over a period of time.

Fig. 8. Calculated percentage of long bones’ completeness for each main domestic animal. Preservation rates are low, with very little difference between species. Colours reflect the different stratigraphic layers (after Morlan, 1994).
Skeletal element representation

All body elements are represented by the groups of the leading domestic animals (sheep/goat, cattle, pigs, dogs). Equid remains are scarce, but they come from different skeletal elements. At this point, one cannot state whether or not they were consumed, as no cut marks were observed on equine bones. An inter-species difference is observed when examining the NISP values and DZ counts of body element representation. The radius and metatarsal fragments are the most abundant for sheep/goat through all stratigraphic periods, while the tibia is underrepresented in layer GK III. Very few fragments from ulnae, pelvises and femora are present in layers GK II, III, each forming under 2% of the total caprine element count per stratigraphic layer (Fig. 9). Femora and ulnae are slightly more abundant in layer GK IV, each representing 5% of the NISP. In comparison, pelvises continue to make up 2% of the assemblage. Phalanges are registered mainly in GK IV. Suid remains exhibit slight variation in element representation through the stratigraphic layers. The only difference is the higher number of the tibia in GK IV (n=32 (21% of all pig elements of the layer)). Metapodia are slightly underrepresented for suids. The mandibula dominates in GK III and IV in bovines, while metatarsals are more abundant in GK II; all other elements do not exhibit any specific pattern. Notably, hyoids from 5 different large ruminants (probably bovine) were discovered in GK II. Apart from them, the only fragment from a single large hyoid was found in strata GK IV.

Like the domestic animals, deer and hare carcasses seem to have been brought whole to the site and butchered there, based on the presence of metapodia, phalanges and cranial elements. Their remains are too few to tell if a particular element dominated the assemblage. Interestingly, we only have a mandibula and a metacarpal from a fox and a single mandibula from a beaver, and this could mean they were attached to a pelt.

Traces

About 40% of the bones have traces of burning, from which the most abundant are black spots caused by tanning due to cooking on fire (Nicholson, 1993). A
significantly smaller percentage is made up of bones with a brown and grey surface. The higher percentage of burned bones are from layer GK IV, where all burned bones have black spots. From GK II, again there are many bones with black spots and a brownish surface. The smaller quantity of burned bones is from GK III (Fig. 10). Most of the black spots are situated on the surface of the epiphyses of the bones. These traces can be caused by exposure of the bone to fire or high temperature (300–400°C), which usually happens when roasting the meat (Fig. 12). The most numerous bones with traces of burning are from sheep/goat, domestic pig, cattle and red deer. A few bones from dog, horse and donkey are burned. The mandible from the beaver and the bird bone also has traces from high temperature/burning.

Very few bones were burned in high temperatures over 500°C (cremated bones). A single unidentified rib, flat and long bone splinters from GK IV represent calcined bone.

Only 80 bones have traces of butchering. Most traces are from dismemberment and filleting of the meat and were caused by a knife. They are about 83% of the all-butchered bones. The knife was the preferred tool for butchering, but the axe and flints were used for dismemberment and filleting of the meat. Interestingly, flint was primarily used in the late layers GK III and VI.

Skinning traces are observed on the skull of sheep/goat, cattle and red deer. An axe was used to remove the horn cores and antlers from the skull. Portioning marks were found only on pig bones made by axe and knife. Filleting as well as dismemberment cut marks were noted on the ribs, pelvis and long bones of cattle, sheep/goat, deer and suids (Fig. 11). The meat was probably filleted and portioned into small pieces to fit into the pots for cooking. This cooking preference is also attested in the pottery assemblage from the site, which is dominated by cooking pots (Nekhrizov & Tsvetkova, 2012).

A total of 189 bone fragments has traces of carnivore and rodent gnawing, but carnivore marks prevail. The traces suggests that part of the food remains was exposed on the surface before accumulating in the stratigraphic layers.

**Discussion**

While over 200 hundred high-altitude sites have been registered in the Rhodope Mountains (Tsvetkova, 2016), most are single layered and few were subjected to a systematic archaeological excavation. The osteological material is of low quantity and quality (high fragmentation). The function of these sites is widely disputed, ranging between cult sites occupying...
natural rock formations (Tsvetkova, 2016; Kiotsekoglou, 2015), seasonal sites linked to a pastoral economy model (Efstratiou, 1993), to permanent settlements for practising some activity utilising natural resources, like mining (Popov, 2009). The only nearby site yielding a more substantial faunal assemblage is the mining centre Ada Tepe, near Krumovgrad (South Bulgaria, Eastern Rhodopes), inhabited during the LBA and EIA. In Ada Tepe, the species composition differs from the Gluhite Kamani, with cattle being the main species, closely followed by sheep/goat. Similar to the site discussed here, the Ada...
Tepe assemblage demonstrates slight variation between the NISP values of the LBA and EIA layers, characterised by a slight growth in cattle numbers during the EIA. These results must be taken cautiously, as the EIA assemblage is much smaller (Nikov et al., 2018). While the presence of caprine remains has been used in favour of the interpretation of some high-altitude sites, like the site of Tsouka (Efstratiou, 1993) as seasonal shepherd stands, the consistent number of pigs at this site prevents the assumption that the Gluhite Kamani site was occupied by a community practicing a specialised type of pastoralism. The debate on whether or not the ancient Mediterranean and Rhodope Mountains’ population practiced an advanced transhumance model before the Middle Ages (Arnold & Greenfield, 2006) falls out of the scope of this study. Still, our data exhibit characteristics of a mixed farming model (Halstead, 1996). Comparing the Gluhite Kamani assemblage to other archaeological sites from the same period faces obstruction from the published data of Early Iron Age and Late Bronze Age Mediterranean sites, because when assessing only the NISP, there is no coherent patterning between the different sites (Fig. 13).

Food or offering or both?

Stratigraphic layers containing abundant animal bones and pottery can be linked to settlement and sacrificial debris. From an archaeological point of view, the two can be hard to distinguish. In recent years the growing body of literature on faunal remains from religious sites has helped establish a series of criteria which characterise cultic deposits (Morris, 2011; Grant, 1984; Peters, 1993). In the Mediterranean, it is generally believed that layers of sacrificial debris must contain charred animal remains, either deposited in pits or re-used in paving the flooring levels (Ekroth, 2017). The Gluhite Kamani site contains a series of hearths. However, based on the recovered assemblage, we currently do not have any data on the ritual burning of specific body parts similar to the “thysia sacrifice” described in ancient written sources (Ekroth, 2009). Few bones display prolonged contact with fire, some exhibiting secondary burning, as it seems they were sporadically thrown into the hearths (Fig. 12). While the preference for a specific bone element and side has been attested in sanctuaries in Greece (Pöllath & Peters, 2011), our assemblage does not account for this as all elements from the commercial/domestic species and deer are represented within the stratigraphic layers. This also means that the animals were brought whole and processed on-site. Vertebrae, pelvises and femora are underrepresented among both the identified and unidentified faunal remains, especially for sheep/goat. Still, this patterning could be attributed to preservation rates as these bones have a thinner, have a more porous matrix, and are prone to weathering. Assemblages in known Greek sanctuaries seem variable regarding topography (Velarde, 2001). A medieval church is present on the highest point of the Gluhite Kamani site, which is located just above the central sector yielding the discussed materials (Nezhrizov, 2012). Underneath the church, a small layer containing EIA materials was recovered. It contained only a few individual bones, which do not allow the tracing of any patterning (unpublished report by Lazar Ninov from 2009). Generally, in known Greek sanctuaries, the faunal assemblages are not very diverse, showing a preference towards a specific domestic species (Tab.5). Sometimes, these preferences match the animal of the deity listed in written sources (Stroud, 1965). Adult caprine and cattle were preferred as the sacrificial victims in Greek sanctuaries from the last phases of the Early Iron Age and Archaic period, as seen from the sites of Dydyma (Boessneck & Driesch, 1983) and the Heraion of Samos (Boessneck & Driesch, 1988). In the Gluhite Kamani site a preference towards a specific age group of animals is absent as the consumption of animals seems to be highly dependent on their overall economic value. Cattle, valued for secondary products and traction, were slaughtered predominantly as adults. In sheep/goat, both meat and secondary products seems to have been taken into consideration, as the numbers of juveniles and adults are almost equal. Pigs were utilised only for their meat, as they were slaughtered at an age where they reached their maximum weight. This patterning is similar to that found in settlements, and the presence of animals of different age stages – infants and juveniles show that they were slaughtered at different times of the year. The age of slaughter does not show any significant variation between the different phases, unlike some settlements like Kastanas, where the cull patterns do vary between the different chronological periods, as it seems the utilisation of the animals in the Early Iron Age shifted from the use of secondary product towards a more meat dependent model (Becker, 1986). While our assemblage does not have any concrete patterning that
can be interpreted as part of a deliberate deposition ritual, we must consider that not all sanctuaries carry out rituals that leave a specific archaeological assemblage. The lack of patterning alone cannot be used to argue that religious activity with banqueting did not occur on the site (Gaastra, 2018). Almost all current knowledge on religious assemblages is based on examples from the Late Iron Age and the
Faunal remains from the Early Iron Age rock-cut complex Gluhite Kamani (Eastern Rhodopes, Bulgaria)

Mediterranean, so it is not possible to say if this population did not have a different practice. When examining the archaeological contexts, there are some implications on the religious function of parts of the site. First, the central sector occupies the foot of one of the rocks bearing a series of artificially cut niches. In the strata of the GK II, a collective find of anthropomorphic and zoomorphic clay figurines was discovered near a hearth. The zoomorphic figurines from the hoard are fascinating, and most seem to portray cattle, with a single figurine resembling sheep (Fig. 13). The interpretation is based both on their horn style and the presence of a yoke. Cattle are underrepresented as taxa on this site and were not the main consumption choice, yet the figurines depicting them were deposited. This phenomenon is widely spread, as it seems that we get depictions of more expensive and valuable animals which would rarely be sacrificed (Russell, 2011). A similar case was present in the Late Bronze Mycenaean sanctuary at Ayios Konstantinos at Methana, north-east Peloponnese, where zoomorphic figurines of bovines dominated, but pigs were the main slaughter victims (Hamilakis & Konsolaki, 2004) (Fig. 14).

What can we tell about the environment?

It is interesting that no major variation exists between the main domesticates NISP counts in the Late Bronze and Early Iron Age strata within this assemblage. While the Late Bronze Age collapse in 1200 BC led to significant changes in the Mediterranean economy and religion (Marakas, 2007), the data do not reflect any significant change in the region’s population. We cannot accept the hypothesis of Dibble & Finné (2021) that the presumable growing dominance of goats in the EIA may be linked to a drought in the Early Iron – Early Iron Age transition, as sheep/goat are a constant species for this site, and seem to be the main exploited species overall in the prehistoric societies of Anatolia and the Aegean (Popkin, 2014; Trantalidou, 2017). On this site, while sheep/goat domestic animals dominate, the faunal assemblage is quite diverse, showing the presence of both domestic and wild taxa, meaning that consumption rates mainly depended on the available species. Interestingly, unlike the synchronous settlement sites of Troy and Kastanas, where wild taxa dominated the transition phase between the Early Iron and Late Bronze Age (Becker, 1986; Gejvall, 1939), the data from this site show that wild animals were more common in the Early Iron Age phases (Supplementary material 04 [.xlsx]).

Conclusion

At Gluhite Kamani, remains from wild and domestic animals were found from which the domestic prevail, but there is great diversity of fauna. These remains are mainly food residues of feasts or offerings at the site. The great diversity of wild and domestic species suggests that all available animals for consumption (wild and domestic) were presented in the layers, but sheep/goat and domestic pig predominates as the preferred animals.

The age of death of the animals shows that sheep/goat were killed and consumed at a young age as well as the adults. The same is true with cattle, but there are also remains from infant animals that were probably killed for special occasions. The sheep/goat cull patterns show that at least two events are happening in spring (May) and autumn (September). The high fragmentation and the traces of burning suggest that probably the meat was cooked – roasted or boiled on the site, which the presence of cooking pots and other pottery and hearths can attest.

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social environment: the evidence from the animal bones. In: Regional stories: towards a new perception of the early Greek world: acts of an international symposium in honor of Professor Jan Bouzek, Volos, pp. 18–21.


Supplementary materials

01 Document title: Metric data from the mammalian remains of the site
Kind of document: Microsoft Excel (OpenXML)
MIME type: application/vnd.openxmlformats-officedocument.spreadsheetml.sheet
Document name: 000512000452023-01.xlsx

02 Document title: Number of unidentifiable bone splinters by size groups
Kind of document: Microsoft Excel (OpenXML)
MIME type: application/vnd.openxmlformats-officedocument.spreadsheetml.sheet
Document name: 000512000452023-02.xlsx

03 Document title: Domestic species skeletal elements (quantified by diagnostic zone counts and NISP); Wild species skeletal elements (quantified by diagnostic zone counts and NISP)
Kind of document: Microsoft Excel (OpenXML)
MIME type: application/vnd.openxmlformats-officedocument.spreadsheetml.sheet
Document name: 000512000452023-03.xlsx

04 Document title: The NISP values from different types of LBA and EIA sites of the Mediterranean
Kind of document: Microsoft Excel (OpenXML)
MIME type: application/vnd.openxmlformats-officedocument.spreadsheetml.sheet
Document name: 000512000452023-04.xlsx