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Malacological Remains from the 2011-2016 Excavations at Khashuri Natsargora and Aradetis Orgora (Shida Kartli Region, Georgia, Southern Caucasus)

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Riassunto / *Abstract*

L'articolo discute i resti malacologici rinvenuti a Khashuri Natsargora e Aradetis Orgora, due siti dell'Età del Bronzo/Ferro nel bacino del Kura nella provincia georgiana di Shida Kartli (Caucaso Meridionale). Il corpus consiste in più di 500 esemplari ed include specie sia di terra che d'acqua dolce (queste ultime soprattutto per Aradetis Orgora), mentre le specie marine rappresentano una porzione estremamente marginale del totale. Il record, ottenuto attraverso la raccolta diretta in corso di scavo, include solo le specie con la conchiglia più resistente e di maggiori dimensioni, più riconoscibili ad occhio nudo e quindi rappresenta solo una parte degli inventari malacologici pertinenti alle sequenze stratigrafiche investigate. Nonostante questi limiti obiettivi, si è ritenuto opportuno presentare i dati raccolti e i risultati della loro analisi, che hanno permesso di ottenere informazioni di tipo paleoecologico e paleoeconomico non prive di interesse. L'analisi dei resti disponibili mostra una chiara predominanza di specie connesse con ambienti aperti e xerici, in sostanziale accordo sia con l'ambiente locale attuale che con i pochi dati paleoambientali disponibili. La debole variazione diacronica della composizione degli inventari suggerisce una sostanziale stabilità ecologica per entrambi i biotopi. L'abbondanza di molluschi d'acqua dolce ad Aradetis Orgora può essere spiegata con la prossimità del sito ai fiumi Prone e Kura, biotopi dai quali essi potrebbero essere stati raccolti intenzionalmente a scopi alimentari, come potrebbero suggerire alcuni paralleli da altre società dell'Età del Bronzo.

The paper discusses the malacological remains recovered at Khashuri Natsargora and Aradetis Orgora, two Bronze Age/Iron Age sites located in the Kura River basin of the Shida Kartli province of Georgia (Southern Caucasus). The corpus consists of over 500 items, which include both land and (especially for Aradetis Orgora) freshwater species, while marine species represent an extremely marginal portion of the total. The record, obtained through direct collection during the excavation, included only the species with the largest and most resistant shell (therefore better recognisable with the naked eye), and represents only a part of the malacological assemblages relevant to the investigated stratigraphic sequences. Despite these objective limits, it was considered appropriate to present the collected data and the results of their analysis, as they allowed to obtain some paleoecological and paleoeconomic information that is not totally devoid of interest. The analysis on the available remains shows a clear dominance of species connected with open and xeric environments, in substantial agreement both with the present local environment and with the few available palaeoenvironmental data. The very weak diachronic variability of the assemblages seems to suggest a substantial ecological stability for both biotopes. The abundance of freshwater molluscs at Aradetis Orgora can be explained with the proximinity of the site to the Prone and Kura rivers, biotopes from which they may have been intentionally collected for use as food, as some parallels from other Bronze Age societies may suggest.

Parole chiave / *Keywords*

Malacologia, Archeologia, Caucaso meridionale, Georgia, Shida Kartli, Fiume Kura, Età del Bronzo, Paleoambiente

Malacology, Archaeology, Southern Caucasus, Georgia, Shida Kartli, Kura River, Bronze Age, Paleoenvironment

1. Introduction

The malacological data deriving from the study of the shell finds recovered during the excavations conducted by the *Georgian-Italian Shida Kartli Archaelogical Project* (Ca' Foscari University of Venice in collaboration with the Georgian National Museum of Tbilisi) at Natsargora (2011, 2012 seasons) and Aradetis Orgora (2013, 2014, 2015, 2016 seasons) are presented below.

To out knowledge, this is the first study of this category of ecofacts from late prehistoric archaeological excavations conducted in the territory of the Southern Caucasus. This documentary gap is not limited to the area in question, as it results from a general lack of interest by the excavators towards malacology, although the information potential of this discipline is well known, especially as regards paleoecology and the reconstruction of the ancient environment.[1]

Regarding the Southern Caucasus, the intensification of archaeological field research in the course of the last twenty years brought about a renewed interest for paleo-environmental research, especially in the fields of paleobotany and palynology.[2] Due to the very diversified landscape, climatic conditions and biodiversity which characterise the region, however, general syntheses about past environmental conditions comparing different types of data are still limited.[3]

The two investigated sites lie, at a distance of about 12 km from each other as the crow flies, in the Shida Kartli province of Georgia, in the Middle Kura River basin (fig. 1). The area consists of a vast intermontane plain bounded to the north by the southernmost fringe of the Greater Caucasus and to the south by the northern slopes of the Lesser Caucasus range. The yearly average temperature is 12-13°C in the lower areas, and 9-10°C on the elevated edges of the region. The annual temperature ranges between 18-24°C.

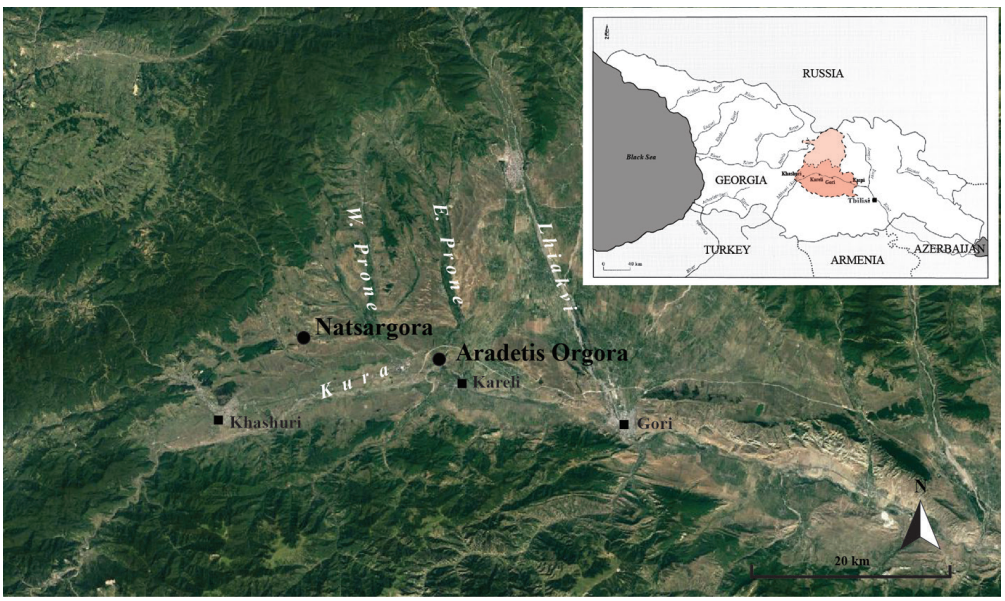


Figure 1 – Satellite image of the Kura River basin with location of the two sites (modified from Google Earth). In the frame: location of the Shida Kartli province of Georgia in red (contended region of South Ossetia in pink)

Marco Palmieri carried out the analysis of the malacological remains and identified the species, Elena Rova provided the archaeological context; the discussion and interpretation of the results are the results of the joint work of both authors.

[1] See on the subject: Allen 2017; Davies 2008; Evans 1972; Girod 2005, 2015.

[2] For Georgia, e.g., Connor 2006; Kvavadze et al. 2020.

[3] A.o., Connor et al. 2004; Connor, Sagona 2007; Connor, Kvavadze 2009, 2014.

Figure 2 – View of the Natsargora mound from SE (left) and landscape from the top of the mound looking E (right) (photos: Georgian-Italian Shida Kartli Archaeological Project)

The landscape is currently strongly shaped by anthropic activities. The valleys and plains of the region are presently used for horticulture as well as for growing wheat (Triticum) and other cereals. The plant component of the province, largely made up of spontaneous arboreal elements in the highland areas that are less suitable for agro-pastoral exploitation, is heavily influenced by anthropic action in the central and eastern plains, where the landscape is open and substantially free of natural or semi-natural biotopes, except for some strips of riparian forests and reduced portions of xerophilous (herbaceous and shrubby) vegetation.[4]

Preliminary results of the analyses on palynological and anthracological samples carried out in the framework of the joint Georgian-Italian expedition suggest that climatic conditions in the Early Bronze Age were slightly more humid and warmer – with a larger presence of floodplain forests – compared to the present-day situation, with the progressive introduction of drier and cooler conditions from the beginning of the 2nd millennium BC.[5] However, they also suggest that the anthropic impact on the natural environment due to long-lasting agro-pastoral exploitation was already considerable by the late 4th-early 3rd millennium BC.

Natsargora (42°04'13" N, 43°42'54" E, fig. 2) is a small mound, ca. 90 m long and 50 m wide, joined by a flat settled area and by a neighbouring cemetery. It lies, at ca 760 m a.s.l., at the eastern limit of the Khashuri district, in an area of smooth hills and valleys mostly developing in EW direction between 600 and 900 m a.s.l., separated from the Kura River valley by a wide erosive glacis.[6] The site is located the confluence of the Natsargorisghele with the Pleula stream, a small tributary of the Western Prone, which in its turn flows into the Kura. It was investigated between 1984 and 1992 by a Georgian team headed by Alexander Ramishvili;[7] the excavations were resumed in 2011-2012 by the "Georgian-Italian Shida Kartli Archaeological Project" under the joint direction of Elena Rova (CFU), Marina Puturidze and Zurab Makharadze (GNM).[8]

According to the results of the new excavations, in the Early Bronze Age the site was the seat of a Kura-Araxes village of rather short duration, which was ^{14}C dated around the 31-30th centuries BC. This resulted in a ca 50cm-thick anthropic accumulation, and was followed by a period of virtual abandonment – corresponding to the Late Kura Araxes/Martqopi phases – and by an ephemeral re-occupation during

[4] Kvavadze et al. 2019.

[5] Kvavadze et al. 2019; Kvavadze et al. 2020 and, respectively, Muscogiuri 2019.

[6] Bertoldi et al. 2012; Furlani et al. 2012.

[7] Ramishvili 2013.

[8] Rova et al. 2010, 2017.

Figure 3 – View of the Aradetis Orgora main mound (Dedoplis Gora) from NW, with Western Prone River on the right and the Kura River valley and the foothills of the Lesser Caucasus in the background (photo: Georgian-Italian Shida Kartli Archaeological Project)

the Bedeni phase (Early Kurgan period, second half of the 3rd millennium BC). There followed, at the end of the Early Bronze Age, a longer period of abandonment, which resulted into the sealing of the EBA layers by an up to 50cm-thick layer of sterile soil, before the establishing there, at the beginning of the Late Bronze Age (mid-2nd millennium BC), of a new sedentary village. The substantial building activities by the LBA/EIA inhabitants of the site not only disturbed to a high degree the intermediate EBA/LBA level, but affected the EBA layers as well, thus contributing to the mixing of Bedeni and KA materials.

Aradetis Orgora (42°02'47" N, 43°51'37"E, fig. 3) is one of the main archaeological sites of the province. It is located on the Western Prone River, near the junction of the latter with the Kura, in an easily defendable position dominating the river valley on the scarp of a river terrace at the southern edge of the gently sloping Dedoplis Mindori plain.[9] The site consists of three different mounds and a cemetery. The Main Mound (Dedoplis Gora) is a 34m-high, steep-sided hill of roughly triangular shape, whose top presently lies around 680 m a.s.l., and whose eroded sides presently measure 70-80 m on the top and ca 150 m at the base.

It was continuously occupied, though with various intensity, from the late 4th millennium BC (Kura-Araxes period) to the 6th century AD.[10] The sequence of anthropic deposits amounts to about 14 meters. The Hellenistic to Early Medieval levels have been the object of long-term excavations by different Georgian teams, whereas the pre-classical sequence was investigated, between 2013 and 2016, by a team of the joint "Georgian-Italian Shida Kartli Archaeological Project" headed by Elena Rova (CFU) and Iulon Gagoshidze (GNM). Two soundings on the opposite sides of the mound put into evidence two parallel sequences of anthropic layers dating from 3000 BC ca (Early Bronze Age, Kura-Araxes period) to 900-700 BC ca (Middle Iron Age). The main phases of occupation of the mound are the Kura-Araxes period, represented by a 4m-thick sequence of layers, and the Late Bronze/Iron Age, which occupies a total thickness of up to 5 m, while the intervening phases – Late Early Bronze/Martqopi and Bedeni cultures (second half of the 3rd mill.) and Middle Bronze Age (first half of

[9] Furlani et al. 2012.

[10] Gagoshidze, Rova 2018a.

the 2nd mill. BC) – appear to have been characterised by less intensive occupation.[11]

The ^{14}C-anchored assemblages of artefacts and ecofacts and the large amount of samples for archaeometric, palyonological and soil-micromorphological analyses collected at the two neighbouring sites during the Georgian-Italian excavations, which are presently in course of analysis, will hopefully represent, in the future, the backbone for a reconstruction of the evolution of the local Bronze and Iron Age cultures and of their relations with the surrounding environment.[12] This report and other, forthcoming ones, are to be intended as preliminary steps towards this global aim.

2. Materials and methods

The study was conducted on the malacological finds directly collected by the archaeologists in the course of the excavation or, to a much lesser extent, recovered by dry sieving, as micro shells and small shell fragments from the numerous soil samples submitted to flotation were not separately collected by the operators. As a consequence, the record includes only the species with the largest and most resistant shell, and represents only a part of the malacological assemblages relevant to the investigated stratigraphic sequences. This fact severely limits its value for reconstructing small-scale environmental changes. In spite of these limits, the study allowed to obtain some paleoecological and paleoeconomic information that is not totally devoid of interest, especially considering the fact that no comparable data had hitherto been published from the surrounding region. The authors therefore decided to present the result of their analysis in its present state.

The finds from Natsargora were collected over a total excavated surface of ca 200 m^2 on a variable depth from 50 to 120 cm. Those from Aradetis Orgora derive from the two 20m-long, 5m-wide stratigraphical soundings (Fields A and B) excavated on the opposite sides of the mound.

The sampled sequence of levels form Natsargora includes:

1) the max 50cm-thick Kura-Araxes level, representing a village of small huts with wide open spaces equipped with different types of firing installations;
2) the ca 50cm-thick mixed layer corresponding to the ephemeral occupation of the EK period and the successive abandonment phase;
3) the bottom, to be dated around the mid-2nd millennium BC, of the up to 2.5m-thick Late Bronze/Early Iron Age occupation, whose upper part had been excavated by the earlier Georgian expedition;
4) the lower part of Late Bronze/Early Iron Age pits cutting the earlier levels.

The anthropic levels were also disturbed by considerable bio-perturbance (modern animal burrows).

At Aradetis, the samples are distributed over the whole Early Bronze/Iron Age sequence, but not all periods are represented with the same intensity. While the LB/IA levels were excavated over the whole investigated area, the Kura-Araxes levels were reached only on part of two 5 x 5 m quadrants, and the intermediate periods (late EBA and MB) were investigated only in two small soundings. Both excavation areas were located on the mound's slope, and were therefore subjected to considerable erosion; the presence of a large number of pits represented a further potential element of perturbation. In spite of this, the sequence consisted of well stratified layers and was excavated with sufficient control of the stratigraphic relations.

The general context of the LB/IA occupation is that of areas located at the settlement's periphery mainly used as open spaces equipped with installations for food preparation (groups of hearths, grinding installations etc.) or used for the disposal of the remains of similar activities,[13] while the context of the Kura-Araxes occupation is that of a village of huts.[14]

Each shell remain was identified from a taxonomic point of view (most often at the species level,

[11] Gagoshidze, Rova 2015, 2018a, 2018b.

[12] See, e.g. Kvavadze et al. 2019; Barbiero, Rova *in press.*

[13] Barbiero, Rova *in press*.

[14] Kvavadze et al. 2019.

more rarely only at the genus or family level) and the minimum number of individuals referable to each species attested in the different Stratigraphic Units (loci) was calculated according to the following criteria: the estimate of the minimum number of registered gastropods was carried out considering the non-repeatable morphological elements, in our case represented for the most part by the protoconches; as for the bivalves, instead, the right and left valves were counted separately and the minimum number of individuals was made to correspond to the number of right or left valves present in a greater number.

To guide the archaeomalacological research and provide further data on the evolution of the local malacocenosis in the long term, some current malacological tanatocenoses were documented during the last excavation campaign conducted at Aradetis Orgora through the collection and subsequent analyses of samples, both of terrestrial and freshwater environment.

Species recognition was initially carried out according to the atlas *Land Snails and Slugs of Russia and Adjacent Countries*,[15] but consultation with dr. Levan Mumladze, researcher of the Ilia State University of Tbilisi, was of essential importance for the correct identification. For the systematic and nomenclature, reference was made to the site W.O.R.M.S. – World Register of Marine Species: http://www.marinespecies.org.

3. Results

The check for individual contexts (loci) which showed a distribution of malacological finds suggestive of a special function gave negative results; on the other hand, the limited areas of the excavated surfaces and the homogeneity of the assemblage composition did not allow even for a general differentiation of it into distinct functional areas. The results of the analysis are therefore presented by site and by general period, where EB includes both Early Kurgan (i.e. late Early Bronze) contexts, and mixed Kura-Araxes/Early Bronze contexts.

The Aradetis Orgora sample was more abundant and will be presented first. The shell remains of over 400 non-marine specimens, 194 of which belong to terrestrial species and 214 to freshwater species, were collected and subsequently determined from the site (fig. 4). There are 6 species in total, 4 of which are terrestrial (*Caucasotachea atrolabiata*, *Circassina frutis*, *Georginapaeus hohenackeri* and *Xeropicta derbentina*) and 2 belong to freshwater environment (*Unio crassus* and *Melanopsis mingrelica*, fig. 5). As for terrestrial malacofaunas, however, it should be specified that the assemblages are clearly dominated by the two species *Georginapaeus hohenackeri* and *Xeropicta derbentina* (fig. 6).

The site of Natsargora returned a more modest amount of malacological finds: 137 in all, largely attributable to terrestrial gastropods (fig. 7). Also in this case, 6 species were identified, 4 of terrestrial environment (*Caucasotachea atrolabiata*, *Georginapaeus hohenackeri*, *Helix* sp. and *Xeropicta derbentina*) and 2 of freshwater environment (*Unio crassus* and *Anodonta* sp., cf. fig. 5).

As for Aradetis Orgora, also in Natsargora the terrestrial environment malacocenoses are in very high percentage constituted by specimens of *Georginapaeus hohenackeri* and *Xeropicta derbentina* (cf. fig. 6).

The remains of marine species represent an extremely marginal portion of the total of the malacological remains at both investigated sites. At Aradetis Orgora, in Late Bronze Age/Iron Age deposits, some fragments of valves were found, referable to one or more species of the Veneridae family, and a Nassaridae intentionally perforated shell, maybe used as an element of necklace, was found in a MB/LB deposit. At Natsargora some Glycymerididae shells were found in Late Bronze deposits. Some of them show a reddish patina on the surface, which could have been intentionally applied, but may also be due to taphonomic circumstances.

[15] Sysoev, Schileyko 2009.

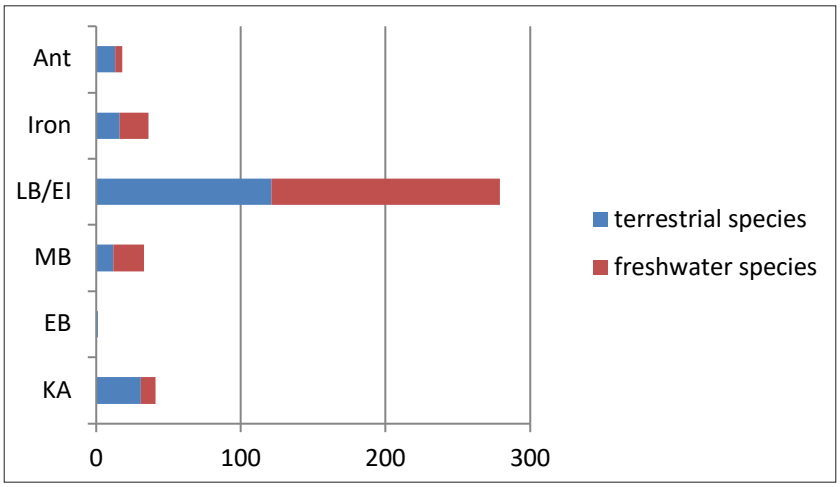


FIGURE 4 – Aradetis Orgora: quantitative comparison between terrestrial and freshwater species

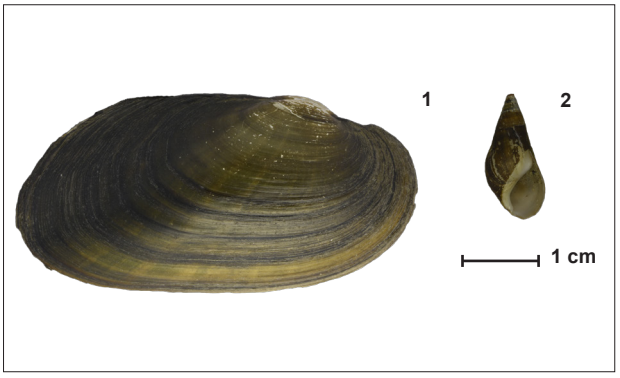


FIGURE 5
1) *Unio crassus*; 2) *Melanopsis mingrelica* (photo: M. Palmieri)

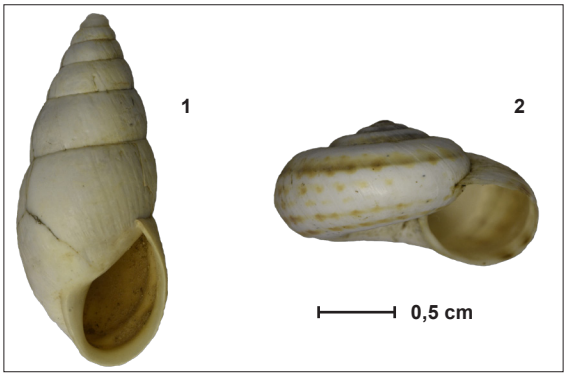


FIGURE 6
1) *Georginapaeus hohenackeri*; 2) *Xeropicta derbentina* (photo: M. Palmieri)

FIGURE 7 – Aradetis Orgora: terrestrial species

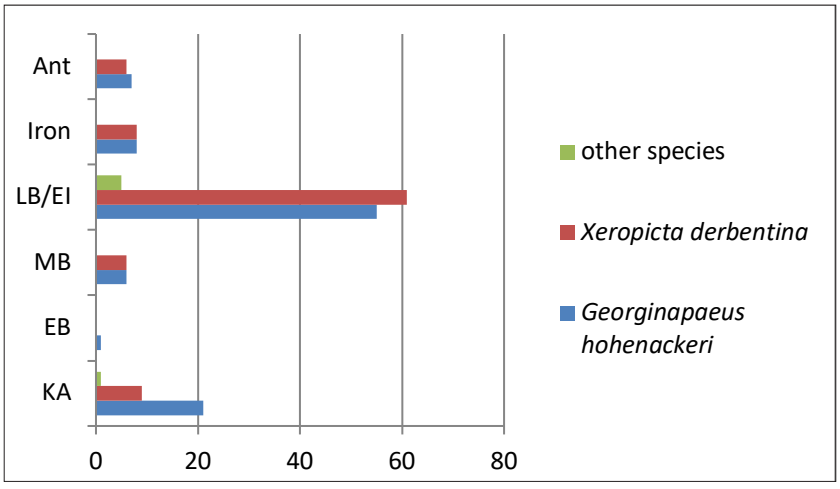


FIGURE 8 – Aradetis Orgora: freshwater species

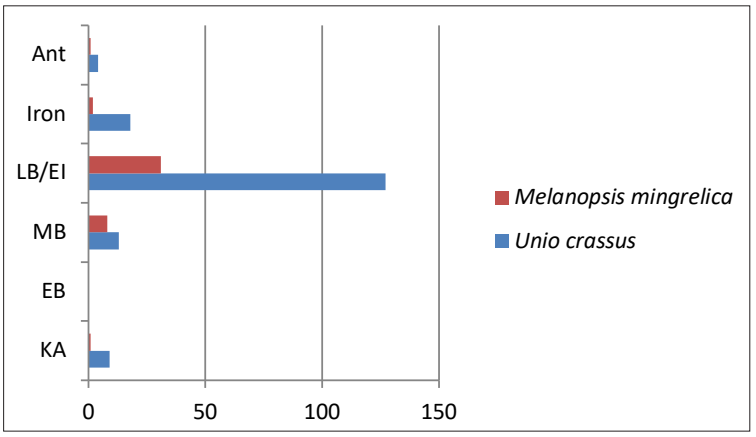


FIGURE 9 – Natsargora: quantitative comparison between terrestrial and freshwater species

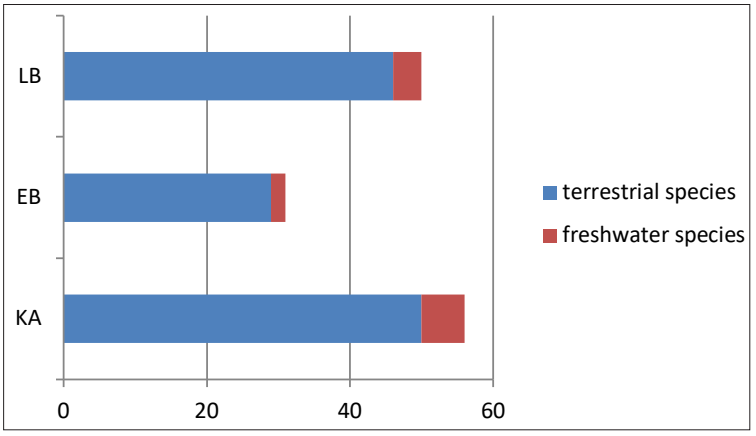


FIGURE 10 – Natsargora: terrestrial species

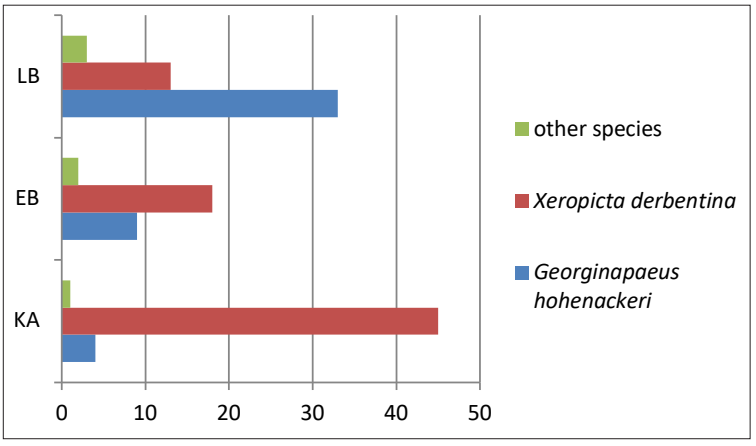
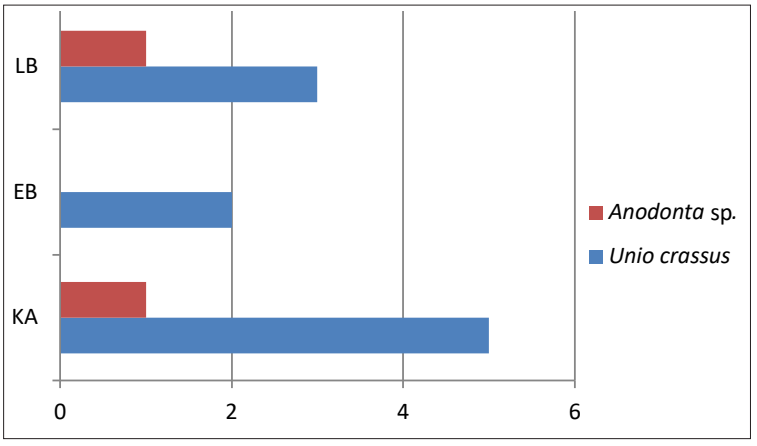


FIGURE 11 – Natsargora: freshwater species



4. Discussion and Conclusions

The most evident aspects that characterise the records of both sites concern on the one hand the scarce variety of the species of molluscs attested and, on the other one, the weak variations, over the centuries, of the malacological population of the examined territories, which suggest a substantial ecological stability for both biotopes at issue.

The presence of a reduced number of species, all of them large or medium-large in size (few remains measure in fact less than one centimeter) is to a large extent due to the methods of recovery of the remains, which did not allow the recovery of the species less recognisable by sight and in particular of those characterised by fragile shells, which are often found in an extremely fragmented state, and of the micro-molluscs, which often constitute a very high percentage of the malacological assemblages (we specify that at present it is not possible to carry out further sampling on these two sites, where the excavated areas have been completely covered after the end of the excavations and where no new investigations are planned for the next future).

Nonetheless, the associations of the documented fauna, as regards both Aradetis Orgora and Natsargora, witness the clear predominance of species linked to open and xeric environments, also subjected to strong anthropic pressure: namely the same species that still dominate the malacocenosis of the area, from what appears from the surface collection conducted by the excavators.

The only slight difference between the two sites is defined by the greater quantity of specimens of *Caucasotachea atrolabiata* in the deposits of Natsargora: the data seems to suggest the presence, near the settlement, of a more complex vegetable landscape, made up at least in part of areas in which spontaneous arboreal and shrubby elements predominate. The remains of freshwater molluscs, found both in the Natsargora deposits and in the Aradetis Orgora deposits but particularly abundant in the latter context, certainly come from the bodies of water close to the settlements.

Given the considerable difference in altitude between the relevant freshwater biotopes and the anthropic layers of the two settlements, it can be excluded that the presence of freshwater molluscs within the latter is the result of natural deposition processes. On the basis of the documented use of the Unionids for food purposes throughout the protohistory and in particular during the Bronze Age,[16] we believe that the valves of *Unio crassus* and *Anodonta* sp., or a large part of them, may represent occasional meal remains, although the depositional circumstances of discovery do not provide any explicit indication in this sense.

Of uncertain interpretation is instead the presence (all in all conspicuous, considering in particular the deposits dated between the Late Bronze and the Iron Age) of the specimens of *Melanopsis mingrelica* found at Aradetis Orgora, since there are no certain data relating to the food use of the species belonging to this genus of gastropods, and the shells do not show any evident sign of intentional working or breaking. The remains in question may have been the object of involuntary passive transport by man, together, for example, with marsh reeds collected and brought inside the settlement as a raw material for building or handcraft productions.[17]

Finally, as for the remains of marine malaco-faunas, we register the presence of very few finds in both investigated contexts. Some of them may have had a use in the craft sector, while the functional destination of the others is unknown.

Any further considerations and conclusions would be premature at this stage of the research and should wait for the availability of larger samples from wider and functionally distinct contexts – for an analysis of the possible economic use of molluscs in the pre-classical periods – and of other assemblages both of malacological and of other ecofacts from archaeological sites of different periods and areas of the Southern Caucasus – for a better characterisation of the local palaeoenvironment(s).

Drawing on the experience gained during this study, the authors strongly recommend, should similar studies be planned in the future, the adoption of procedures capable of providing

[16] See for example, as regards Italian protohistoric sites, Palmieri 2018 and related bibliography.

[17] Similar considerations in Fernández-López de Pablo, Gabriel 2016.

a more exhaustive record (to be agreed between the archaologists and the specialist to whom the archaeomalacological analyses is to be entrusted), capable of providing more accurate paleoenvironmental results based on shell remains. In case the specialist may not be able to carry out the sampling him/herself on the field, it may be useful, when floating earth samples on site, to collect the floating material by a 0.5mm sieve according to the procedures recently indicated by M. Palmieri.[18]

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[18] Palmieri 2020, 13-14.

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