

## Preliminary report of archaeological investigation at Kharagauli Middle Paleolithic site (2023)

ხარაგაულის მღვიმე, 2023 წელს ჩატარებული არქეოლოგიური სამუშაოს ანგარიში

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**აბსტრაქტი.** ხარაგაულის მღვიმე 2018 წელს შემთხვევით აღმოჩნდა ხარაგაულის მუნიციპალიტეტში არქეოლოგიური დაზვერვების ჩატარების დროს. იგი გამოჩნდა მას შემდეგ, რაც 2014 წელს ხარაგაულთან, სოფელ ბაზალეთის ტერიტორიაზე ე.წ. მე-12 გვირაბთან მოხდა კლდის მასივის აფეთქება. დაზვერვების შედეგად, წინასწარულმა სამუშაოებმა დაგვანახა, რომ საქმე გვაქვს შუა პალეოლითის ადამიანის სადგომთან. მღვიმის ჭრილში გამოჩნდა ორი კულტურული ფენა, რომელთა შორის ქვედა ფენის მასალა ტიპოლოგიურად ძალიან არქაულად ჩანდა. ამ აღმოჩენამ დიდი ინტერესი გამოიწვია და ჩვენ შემოგვიერთდნენ ჩვენი უცხოელი კოლეგები, პროფ. ერელა ჰოვერსი (იერუსალიმის უნივერსიტეტი). პროფ. მარეიკე შტალშმიდტი, თომას ბერდი (ვენის უნივერსიტეტი), და ჩვენი კოლეგები საქართველოს ეროვნული მუზეუმიდან დოქტ. ნინო ჯაყელი, დოქტ. ელისო ყვავაძე და დოქტორანტი ნიკოლოზ ვანიშვილი. ეს ყველაფერი იმდენად საინტერესო აღმოჩნდა, რომ პირველივე მოთხოვნით მოვიპოვეთ ნაციონალური გეოგრაფიის საზოგადოების (NGF) ფინანსური გრანტი, თუმცა კოვიდის პანდემიის გამო 2019-22 წლებში ვერ მოვახერხეთ ფართომასშტაბიანი სამუშაოების ჩატარება. მხოლოდ 2023 წელს შევძელით შედარებით სრულფასოვანი სამუშაოების ჩატარება. გაინმინდა და პრეპარაცია გაუკეთდა მეტრ-ნახევარი სიგანის ნიადაგს. მთელი ჭრილის სიღრმეზე, ადებულ იქნა ნიმუშები აბსოლუტური თარიღებისთვის, დნმ-ს დადგენისთვის, პალინოლოგიური ნიმუშებისთვის და სხვა ანალიზებისთვის.

**საკვანძო სიტყვები:** მღვიმე, პალეოლითი, დასავლეთ საქართველო  
**Keywords:** Cave, Paleolithic, Western Georgia

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The site of Kharagauli is named after the closest town. It is located in the western part of Georgia, on the right bank of the River Chkherimela (N 42°01'43"E 43° 11'47", elevation ~300 m above sea level) (Fig.1). The site is a remnant of a much larger cave that was destroyed during the construction of a new railway tunnel in 2018, when the site was first recognized. What remains is part of the deepest part of the cave, visible as a large patch (over 8 meters along the cliff face) of dark cave sediments against the light-coloured limestone cliff face.

Initial work in 2019 revealed an exclusive Middle Paleolithic occupation. The deposits extend 2 meters deep into the cliff and are ~1.5 m-thick, with evidence for syn- and post-depositional geogenic and anthropogenic formation processes. This first season of excavations yielded some 400 lithic artifacts and ~300 faunal remains >1 cm.

The bones represent large and medium bodied herbivores (both cervids and bovids; *Cervus elaphus*, *Megaloceros* sp., *Bison* sp., *Capra* sp.), a feline carnivore (*Panthera* sp.) and a marten (*Martes marten*). These findings and the relatively high density of artifacts and bones are unusual for the region, as is the presence of only one cultural period. Work in 2019 identified two Middle Paleolithic units, based on the nature of the artifacts. There is also evidence for burning of both lithics and fauna.

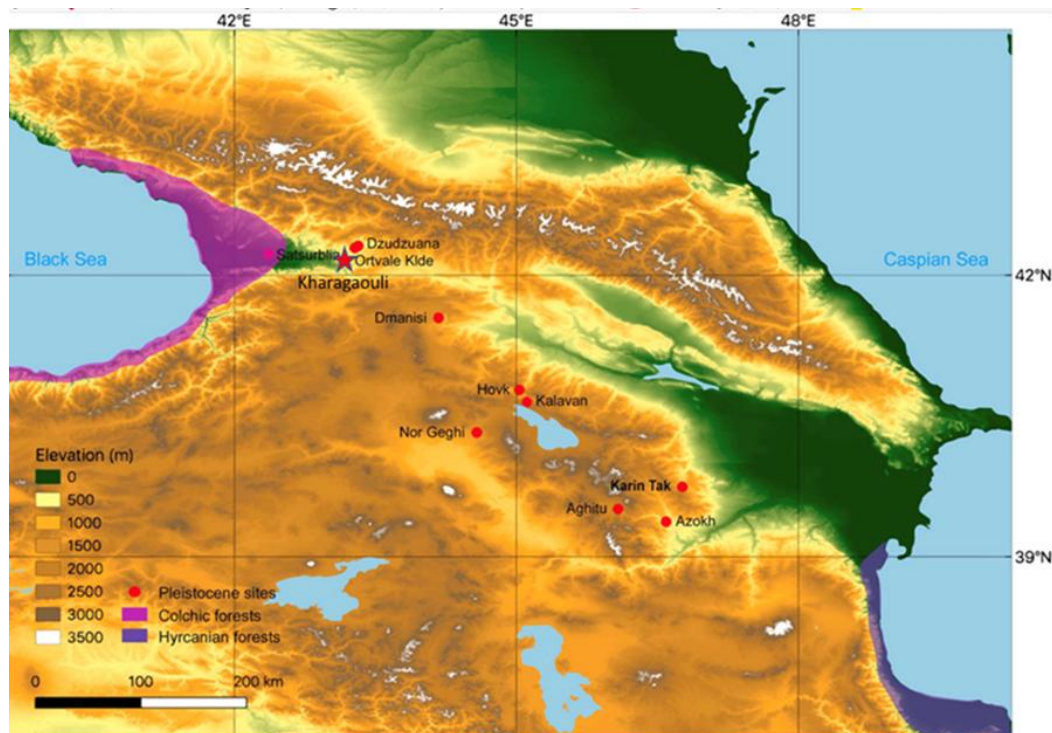


Figure 1. Location map of the site

The current NGS grant follows from these first discoveries, aiming to obtain larger samples of the lithics with precise locations, to address the questions of cultural differences, to obtain samples for OSL dating and collecting sediment sampled to check their suitability for sediment aDNA extraction. Work at the site has been delayed, first due to COVID-19 and later because of major infrastructure changes in the practices of cultural heritage management in the Republic of Georgia. Throughout this time, however, the team carried out operations at the site for its

conservation and in order to facilitate the planned excavations. Such work included the cutting of vegetation so that the section is visible and available for documentation, as well as the mapping of the site and establishing a grid for future excavations using a total station machine (Fig.2). In addition, permits were obtained from the Georgian railway company to build a temporary scaffolding prior to this year's field season so that the cliff face containing the remnant of the cave could be accessed safely (Fig.3; Fig.4; Fig.5).

The 2023 fieldwork season was conducted in September, directed by the PI. Additional personnel included Dr. Nino Grigolava, Dr. Erella Hovers (Hebrew University), Dr. Mareike Stahlschmidt (University of Vienna), students from the university of Tbilisi and local workers. During the season we excavated the eastern part of the cave (squares G-I, 4-2), where the vast material of the sediments was assigned to the lower cultural layer, down to bedrock and extended

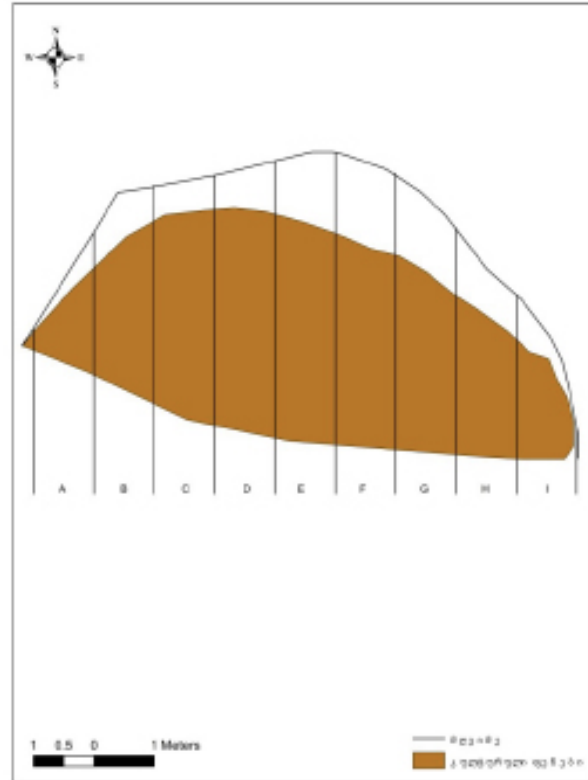


Figure 2. Schematic view of the site as seen in section. The shading shows area of the cave sediments in the cliff face



Figure 3. The site as exposed in the cliff face

excavations to the west, where the sediment column is longer and contains a long sequence. In this part (squares G-H, 2-3), sediments assigned to both cultural layers were observed. Excavations were carried out within a 1X1 m grid within vertical spits of 10 cm, typically (Fig.6). All the sediments were wet sieved through a 2 mm mesh.



Figure 4. Work in 2019 to prepare the site for excavation



Figure 5. Schematic view of the site as seen in section. The shading shows area of the cave sediments in the cliff face

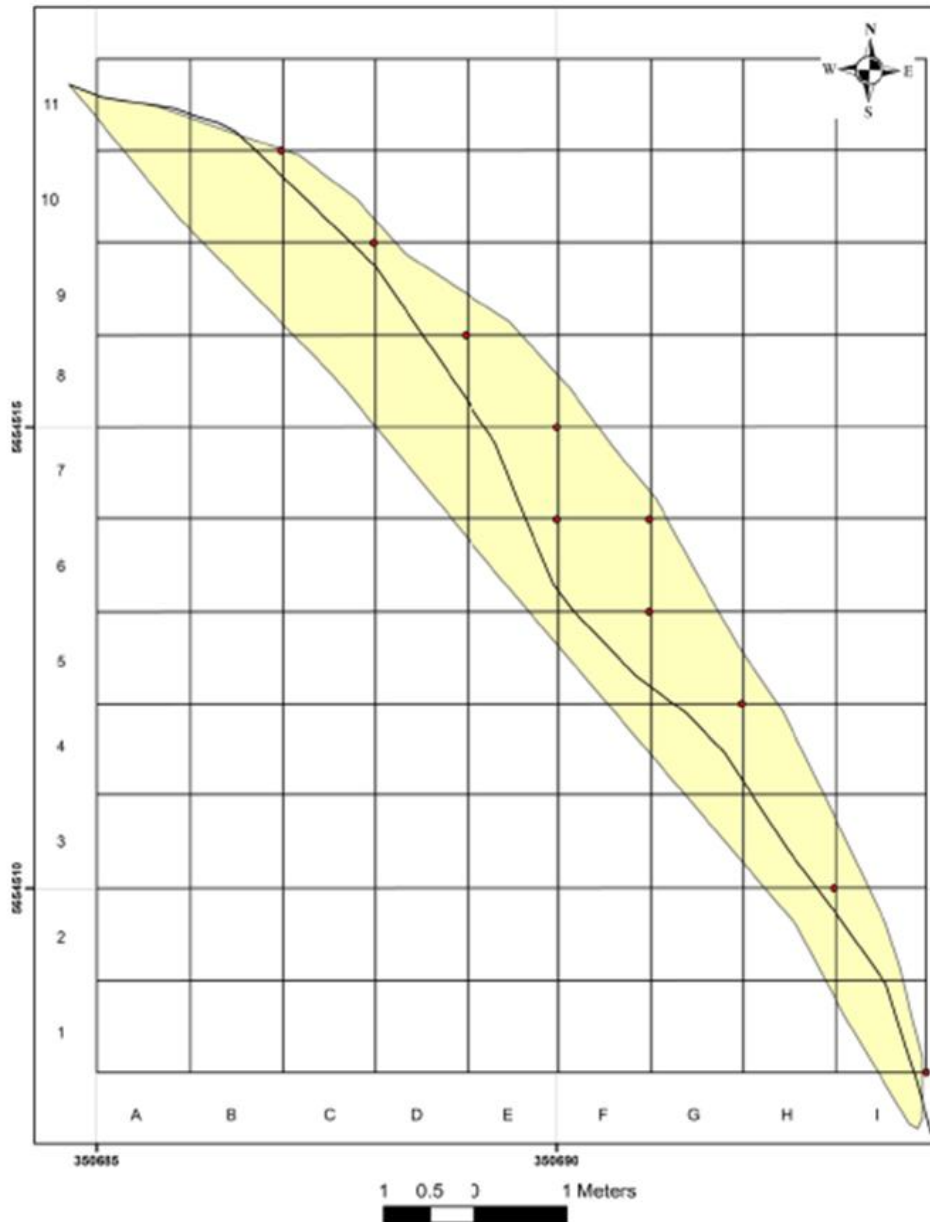


Figure 6. Map of the site showing its extent across the cliff face (E-W) and its depth (N-S). Anthropogenic sediments indicated in yellow. Bold line in the middle represented the projection of the bedrock roof

The main field observations are as followed:

There are two clear sedimentary units in the site:

1. The top sediment complex consists of a reddish loam, disturbed by root penetration and other biological agents, relatively loose and coarse. The lower sediment complex contains sediments that are lighter in colour, appear to be more fine-grained and compact. At places they were very hard to excavate. In this lower complex we noted the appearance of sediment laminae, lenses of pebbles and more extensive horizon of such pebbles (Fig.7). Such horizons might suggest some fluvial activity within the cave, though the direct agent and processes involved could not be identified at this stage. One possibility is that the paleo-Chkherimela channel flowed at a higher elevation than its present course, and extensive floods occasionally penetrated all the way to the back of the cave. Given that the difference in elevation between the current riverbed and the cave floor is ~20-25 m, and that the distance would have been several tens of meters,

this may not be a feasible explanation. Other mechanism for the depositions of the pebbles should be explored.

2. In the area excavated this year, the cultural materials within the sediments of the lower complex are sparse. The same holds for faunal remains. However, all the artifacts are attributable in general to the Middle Paleolithic as known from other Georgian cave sites. Sediments excavated from the younger complex contained more artifacts and fauna, comparably.

3. The amount of material collected from the lower complex is not sufficient to address the hypothesized cultural dichotomy (and possibly time differences) between the lower and upper sediment complexes. Regardless, our initial conclusion that the material is Middle Paleolithic remains valid.

4. Overall, several hundreds of lithic artifacts were retrieved. At this time, cleaning and sorting operations have not been finished so the exact number cannot be reported. The assemblage is mainly flake oriented, but some larger and more elongated pieces were also retrieved.

5. The artifacts collected from the site (mainly from the top sediment complex) are all made on flint. We noted several varieties of flint, the sources of which are not known at the moment. At least one of the raw materials seems to be a variety of red flint that is well represented in sites dated to the early phase of the Middle Paleolithic and is less represented in later Middle Paleolithic sites.

6. The frequency of retouched artifacts is relatively high. The retouch tends to be rather invasive. There is a clear dominance of pointed forms (retouched Mousterian points, convergent scrapers etc.) among the retouched items (Fig.8).

7. Faunal elements are fragmented. Fragment sizes vary between a few millimetres to several centimetres. The majority of pieces are fragmented long bones but there were also teeth, some metatarsal and metacarpal bones. Percussion marks were visible on many of the bones (Fig.9). In most cases striation or cut marks could not be discerned due to the cemented carbonates adhering to the bone face. However, when visible, cut marks are clear, deeply incised (Fig.10).



Figure 6. View of Square H3. Not lamination of sediments and pebbles. The light and dark colouring are due to post-depositional leaching and straining



Figure 7. Retouched pointed artefacts. Note the red flint (middle and right) and the light-coloured, more calcified (left) flints. Note also size differences

8. There is clear evidence of fire at the site. We were not able to identify specific combustion features in the field, but there are clear signs of burning on bones (in the form of blackened to calcined bones) as well as on lithic items (the appearance of pot lids, crazing marks). Importantly, some of the pieces have a glossy, pinkish appearance that is consistent with more controlled heating than accidental burning.

The results of this field season open up a number of important questions regarding the nature of the occupations at the site, whether they are of two different time frames within the Middle Paleolithic, and the site's 'authors'. To address these questions, Dr. Stahlschmidt collected two samples for aDNA analysis, one from each of the sedimentary complexes. These samples were exported to her laboratory in the university of Vienna for analysis (Appendix ). We expect first results within a year. Following this, we collected from the same sediments (in fact, from the exact same locations) samples for OSL dating, following the common sampling procedures for such dating. We excavated into the sediment in order to obtain sediments that had not been exposed to recent sun light. The sampling was carried out in relative darkness and bagged immediately in light-proof black bags. These samples will be shipped to the Geological Survey of Israel, where Dr. Naomi Porat runs a lab dedicated to such analyses. Samples were also taken for mineralogical analysis (FTIR) of some sediment, pebble and artifact samples.

During post-excavation work, we put aside artifacts that were deemed interesting for use-wear studies (mainly the pointed items) and did not clean them in any way, so that we could engage an expert in the field to conduct a pilot study on these pieces and determine how they (as well as others could be mined for information). A raw material study of flints in Middle Paleolithic sites in Georgia is currently being initiated, in which samples from Kharagauli will be incorporated and compared with other sites (see above). Kharagauli is unusual in its context and many of its archaeological contents when compared to other MP sites. Further excavations at the sites would be extremely important in the study of the behavioural variability on MP populations in the Caucasus.



Figure 8. Cut-marked bone from complex I



Figure 9. Cervid teeth from complex I. Both young and adult individuals are represented

## Appendix

### Sampling for Micromorphological and SedaDNA Analysis at Kharagauli Cave

By Mareike C Stahlschmidt and Thomas R. Beard

We visited the Middle Paleolithic site of Kharagauli on August 21st, 2023, and collected two block samples for micromorphological analysis and four respective bulk sediments for sedaDNA analysis from the two cultural layers. Kharagauli Cave is an artificially cut limestone cavity next to train tracks with a 1.5 m sequence of sediments preserved inside. The sediments consist of very dry, brown sandy loam with limestone gravel. Recent root activity can be observed throughout the profile. Two cultural layers were previously distinguished and were readily observable in the section as two distinct bands with lithic artefacts and bones. Block sample KHA 23 1 contains cultural layer 1 and block sample KHA 23 2 cultural layer 2 (Fig. 1 and 2, Table 1). We measured the elevation of the block samples (top and bottom) from a defined point on the excavation balcony (Fig. 3).

Sample Code	Cultural Layer	Associated block	Relation to block	Sediment description
KHA 231	1	+94 cm to +76cm	Very dry brown loam. Broke apart in aggregates	Recent roots
KHA 232	2	+27 cm to +10cm	Slightly paler brown than KHA 23 1, came off in powder. Very hard and massive	

Table 1. List of block samples collected for micromorphological analysis.

We retrieved two bulk sediments for sedaDNA analysis behind each block sample (Table 2 & Fig. 2), but due to the extreme dryness of the samples and the signs of recent bioturbation we have little hope of retrieving authentic ancient DNA and did not take further samples.

Sample Code	Cultural Layer	Elevation	Sediment Description	Comments
KHA 23-D1	1	KHA 23 1	Bottom Inside	Very dry brown loam with yellow patches. Broke apart in aggregates
KHA 23-D2	1	KHA 23 1	Top Inside	Very dry brown loam. Broke apart in aggregates
KHA 23-D3	2	KHA 23 2	Bottom Inside	Slightly paler brown (compared to D1 & D2), came off in powder. Very hard and compacted/cemented/massive
KHA 23-D4	2	KHA 23 2	Top Inside	Slightly paler brown (compared to D1 & D2), came off in powder. Very hard and compacted/cemented/massive

Table 2. List of bulk sediment sample for sedaDNA Analysis

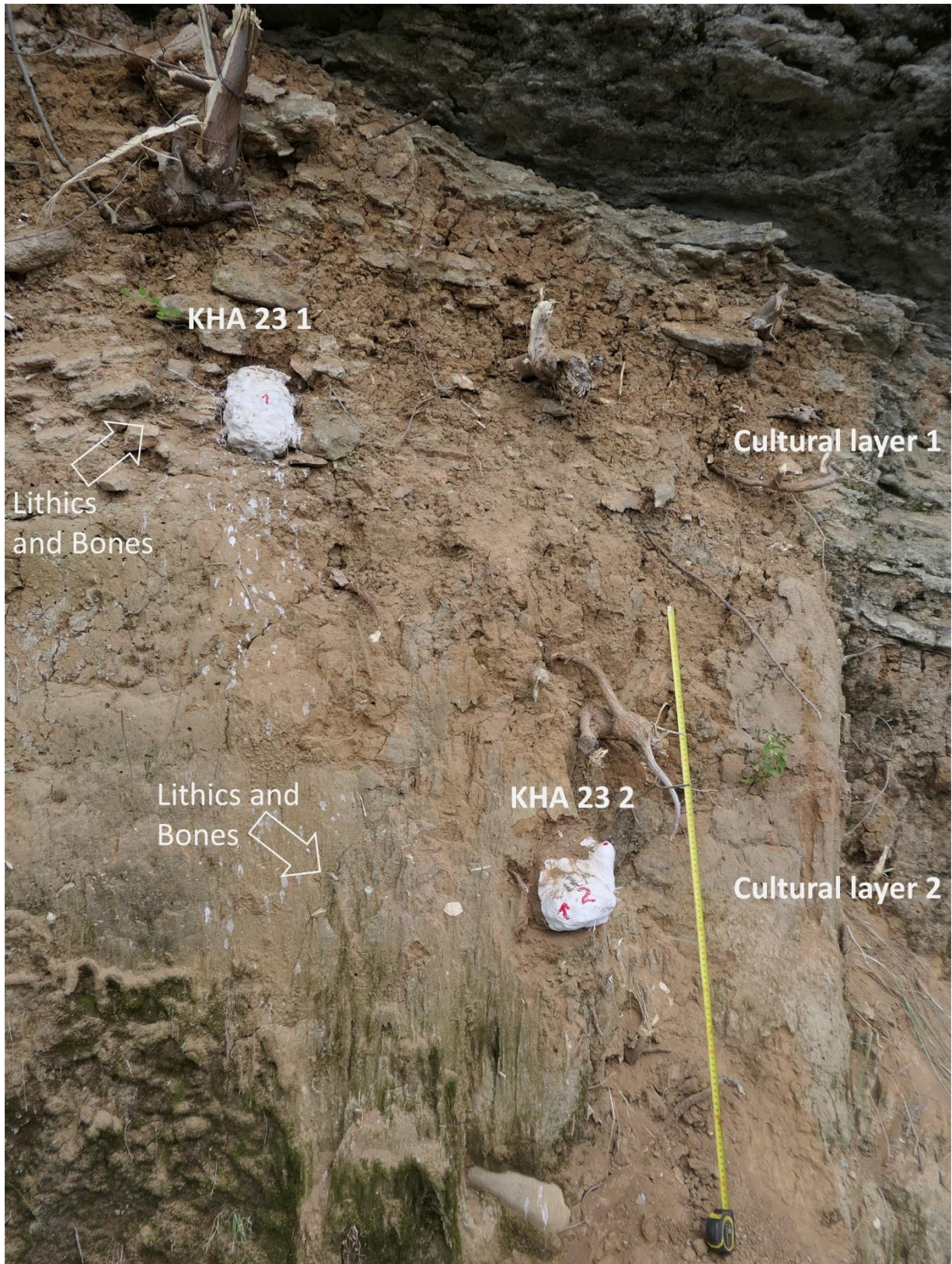


Fig. 1. Sedimentary sequence in Kharagauli Cave. Block samples KHA 23 1 and 2 were retrieved from cultural layer 1 and 2 respectively. Both cultural layers show the presence of lithics and bones but natural limestone clasts were also observed and profiles are affected by root activity. Scale 1 m.



Figure. 2. Backside of each block samples showing a very dry, brown grainy loam with occasional coarse clasts, bones, flints or limestone. In KHA 23 1 a crumb to blocky structure could be observed and roots penetrate the sample. KHA 23 2 showed a homogenous structure. Bulk samples for sedaDNA were retrieved from the negative of the block samples in the section.



Figure. 3. We took the elevation of the block samples from the illustrated point in the excavation balcony.