



Report on the Activities of the Seventh Field Season of the Georgian-Italian Lagodekhi Archaeological Project (GILAP), June-July 2023

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INTRODUCTION

The seventh field season of the project of Ca' Foscari University of Venice (Italy) in cooperation with the Lagodekhi Regional Department of the Ministry of Culture, Sport and Youth (Georgia) took place from June 21st to July 31st 2023 (**Fig. 1**). The Italian team arrived in Georgia on June 22nd and reached the village of Apeni, where the expedition house was located, on June 23rd. The group left Apeni to Tbilisi on July 26th, and flew back to Italy on July 31st.

The Italian group was headed by prof. Elena Rova of Ca' Foscari University (co-director of the project) and included the following archaeologists: Francesco Bianchi (PhD candidate at the Ludwig-Maximilian University of Munich, Germany), Gaia Babolin and Vanessa Perissinotto, MA, Sebastiano Claut and Mirea Peruzzi, BA (MA students at Ca' Foscari), Michela Ferracin and Ieva Vaskelaite (BA students at Ca' Foscari), and Massimo Mirabella, MA student in Anthropology at Ca' Foscari. The following Italian and international experts joined the expedition for shorter periods: prof. Giovanni Boschian (University of Pisa), geo-archaeologist, prof. Francesca Bertoldi, Piera Allegra Rasia, MA (Ca' Foscari University), prof. Pier Francesco Fabbri (Università di Lecce), physical anthropologists, and Lena Lambers (Gaia Prospection, Leiden), specialist in geomagnetic prospections.

The Georgian team was composed of: Davit Kvavadze (Director of the Lagodekhi Museum, co-director of the expedition), Giga Bakradze (MA student at Ivane Javakhishvili Tbilisi State University), joined for shorter periods by the following experts: prof. Mikheil Elashvili and Levan Navrozashvili, PhD candidate (Ilia University, Tbilisi), geologists, prof. Eliso Kvavadze, palynologist (Georgian National Museum Tbilisi), prof. Liane Bitadze, physical anthropologist (Ivane Javakhishvili State University), Nika Tskvitinidze, PhD, topographer.

AIMS AND ACTIVITIES OF THE SEASON

The expedition did not carry out excavations this year, but concentrated, instead, on concluding the study of the materials recovered during the previous seasons, performed different types of geo-archaeological investigations and carried out preparatory activities for new research to be launched in 2024.

The first aim of the season was to complete the documentation of the finds from the excavations carried out in 2022 at the sites of Tchiauri 1 and 2, close to the homonymous village (Georgian ჭიაურის), formerly known as Ulianovka, in the southern part of the Lagodekhi Municipality, and from the 2022 survey season. This activity was carried out by all members of the expedition at the excavation house in Apeni, and continued during the whole season.

The second aim was to integrate the geo-archaeological research carried out during the previous years with deep coring at selected locations in the southern part of the Municipality in order to clarify the recent sedimentological history of this section of the Alazani plain, especially as far as the phases preceding the beginning of the Chalcolithic period (ca 5000 BC) are concerned, for which no archaeological material had ever been recovered either during surface investigations or by casual finds. This activity took place between July 2nd and July 17th under the responsibility of Giovanni Boschian and Levan Navrozashvili. During this period, both scholars attended the congress “Georgia Historical Ice-Core Project (GHICP) Workshop: Pilot publications and next stages” (July 11-12) at Ilia State University in Tbilisi.

Between July 11th and July 17th Lena Lambers performed geomagnetic prospections around one of the large 3rd millennium BC kurgans of Ananauri (Ananauri kurgan 9). By these, we tried to highlight the possible presence of subsidiary structures or other traces of occupation connected with a contemporary or later ritual frequentation of these monumental funerary barrows.

Gaia Babolin, assisted by Michela Ferracin, spent one week (from July 2nd to July 7th) at the Kareli local Museum (Shida Kartli region), where she studied the groundstone tools recovered by the expedition at Aradetis Orgora in 2013-2016, for the final publication. She took silicon casts of selected surfaces for use trace analyses and samples of residues for palynological analyses to be carried out by prof. Eliso Kvavadze at the GNM.

From the beginning of the season to July 17th, Massimo Mirabella carried out some preliminary research for his MA thesis in cultural anthropology about animal husbandry practices in Kakheti region, focusing on transhumance routes between Kakheti and Tusheti. In this framework, on July 8th-10th part of the team visited Tusheti, where Mr. Mirabella carried out some interviews with transhumant shepherds.

During the second half of July, Francesca Bertoldi and Pier Francesco Fabbri, assisted by Piera Allegra Rasia, spent 15 days between Tbilisi and Borjomi, where they carried out a preliminary analysis of human bones from Medieval monasteries of the district (Potoleti, Green Monastery, and Churches of the Monk, Kvibisi village = Berisaqdrebi = Bertasakhtavi) as a preparatory step for a larger study and publication project to be developed in the future. Three of the skulls were scanned by Mirea Peruzzi in Tbilisi with the 3d laser scanner of the expedition.

In the course of the season, visits were paid by Elena Rova to the Georgian National Museum and to Ilia University in Tbilisi in order to discuss future projects, to be carried out in 2024, about scanning complete Kura-Araxes vessels from the Shida Kartli region and, respectively, initiating a new research project in the Gardabani district of the Kvemo Kartli province.

Finally, the team continued the program of didactical and dissemination activities for the local public which was started in 2019. The target of this year lessons were secondary school students from the Apeni village, who were given an introductory seminary about archaeology at the expedition house.

The following paragraphs contain a detailed description of the season’s activities.



Fig 1. Group photos of the Georgian-Italian Lagodekhi Archaeological project 2023 Field season team

STUDY OF THE MATERIALS FROM THE 2022 EXCAVATIONS AT TCHIAURI 1 AND 2 AND FROM THE 2022 SURVEY SEASON IN THE LAGODEKHI MUNICIPALITY (VANESSA PERISSINOTTO, GAIA BABOLIN)

The documentation of the finds from the 2022 season was successfully completed at the expedition house in Apeni. All pottery and stone finds from the excavations carried out at Tchiauri 1 and 2 were drawn, photographed and described, and the relevant data were inserted in a dedicated database under the responsibility of Vanessa Perissinotto and respectively Gaia Babolin. The same was done from the material deriving from the intensive surface collection at Tchiauri 1 and from the 2022 survey material (Lagodekhi Municipality survey as well as areas of intensive survey in the Tchiauri cluster area).

Our primary target was the ceramic material from the Tchiauri 1 and 2 excavations, both of which yielded a considerable amount of pottery sherds. Their overall preservation state proved to be quite poor, characterised by severe fragmentation and encrusted surfaces. Unfortunately, no complete profiles were retrieved, and reconstructing the basic morphological types posed significant challenges.

The corpus consisted of 3,537 sherds, 847 of which (amounting to 23.95% of the total) were identified as diagnostic types. They had been washed, dried, categorised into general periods, counted and weighted using an electronic scale in 2022. This year we shifted our focus towards the analysis of diagnostic fragments, which were individually described, drawn and photographed (Fig. 2).



Fig. 2. Mirea Peruzzi drawing pottery

The analysis (**Fig. 3**) confirmed that the primary period represented in Tchiauri 1 and 2 is the transitional phase between the Late Bronze and the Early Iron. Interestingly, we also discovered a substantial quantity of materials dating back to an earlier phase of the Late Bronze period, as well as artefacts from the broader Iron Age.

Additionally, as already observed last year, a small amount of sherds of the Hellenistic, Medieval, and possibly Chalcolithic and Middle Bronze Age was also collected from the surface of the mound or from sub-surface layers. They were interpreted as materials displaced by the intensive agricultural activities carried out on the site in the 20th century AD.

During this year's campaign, we confirmed the subdivisions proposed last year regarding the ware groups. The main corpus was categorised into three distinct ware groups based on surface colour, treatment, building method and temper: Black Ware (BW), Grey Ware (GW), and Light Brown Ware (LBr). It is worth noting that these ware groups do not appear to be associated with specific shapes or decorations, since common morphological and stylistic elements are present in all of them. Due to the small dimensions and highly fragmented state of most items, distinguishing between handmade and wheel-made pottery remained a challenging task.

The most numerous ware group is Black Ware (BW), accounting for 56.8% of the total. Sherds belonging to this group exhibit black or dark grey colours and are typically tempered with small to medium-sized minerals. In most cases, they were fired in a reducing atmosphere, resulting in very dark colours on both the surface and core (GLE Y1 2.5/N black). Occasionally, incomplete reduction processes can be observed, evidenced by a lighter colour in the core (10YR 6/1 gray; 2.5Y 6/3 light yellowish-brown). Some sherds are smoothed and/or polished, while others lack any specific surface treatment, although this might be attributed to the general poor preservation of the assemblage.



Fig. 3. Vanessa Perissinotto analysing pottery

The second most numerous group is Grey Ware (GW), which represents 34.6% of the total. The reduction of these items is generally partial, leading to surfaces and sections exhibiting light colours (GLEY1 6/N; 5/N grey). Sometimes, a reduced core is visible (GLEY1 2.5/N black). The fabric of this ware is usually heavily mineral-tempered, containing fluvial minerals and medium to large-sized quartz fragments. Initially, there was uncertainty about the building method, as the coarse nature of the fabric suggested a handmade procedure due to the difficulty of handling it on a rotating wheel. However, upon further analysis, clear signs of wheel-throwing were detected in a significant number of pieces. The vessels were generally smoothed or slightly scraped in order to regularise their surfaces, and traces on them suggest the possible use of a brush made of vegetal fibres. We took some casts of these surfaces in order to clarify which tool(s) had been used on them.

The third and least frequent ware group is Light Brown Ware (LBr), representing 8.6% of the total. The sections of these items are completely reduced (GLEY1 2.5/N, black), while the surfaces are generally oxidised, resulting in a cream/light brown colour (e.g., 7.5YR 6/3; 6/4 light brown or 7.5YR 6/2 pinkish gray). This ware is characterised by its coarse nature and contains a significant amount of medium to large mineral inclusions. The surface of the sherds is occasionally smoothed or slightly polished. Interestingly, this ware bears a striking resemblance to the most typical Chalcolithic ware found by our expedition at Tsiteli Gorebi 5, only a few kilometres away from the Tchiauri sites. In fact, distinguishing between the two wares is often quite difficult if their stratigraphic context is unknown and if typical morphological features are not present.

Regarding vessels morphology, due to the limited size of the assemblage and its generally poor preservation, it was not always feasible to categorise items into specific classes and/or even determine their exact diameters. Despite this limitation, some common vessel types have been observed, including short-necked ovoid jars, hole-mouth jars/pots with variously shaped inturned rims, bowls, carinated cups with everted rims, and open flat-based plates with straight walls. All these vessels feature flat or flattened bases, and some even exhibit an impressed "fingernails" decoration, although raised bases are rare. Notably, a distinctive rim type is characterised by having a groove on the inner side, possibly intended for securing a lid.

The repertoire of decorations is rather limited and repetitive. Several types are widely attested in the advanced phases of Late Bronze/Early Iron Age cultures of the Southern Caucasus: "nail impressions," combed-incised lines arranged in horizontal or vertical patterns, corrugated-incised horizontal lines, rows of parallel incised wavy lines, and rope-shaped slashed bands. Occasional instances of pattern-burnished decoration have been also identified.

Preliminary analysis indicates that all shapes, decorations, and surface treatments are shared across different ware groups, with none of them being specific to a particular ware group.

A significant collection of sherds from the sites has been attributed to the Iron Age, primarily due to their apparently later characteristics when compared to the preceding group. Most of these sherds originate from disturbed sub-surface layers or were recovered from pits that cut through the well-preserved Late Bronze/Early Iron (LB/EI) level, providing additional evidence supporting their later dating. While we can tentatively propose an initial attribution to the Early Iron 1 or 2 periods, it is important to note that most of these sherds lack specific diagnostic features, and their high degree of fragmentation hampers our ability to attribute them to distinct types. Their fabric typically displays full oxidation, resulting in an orangey coloration, and the surface is commonly smoothed or slightly polished. Regarding decorations, characteristic elements consist of a single incised wavy lines or groups of straight, incised parallel lines.

In general, the pottery assemblage discovered at the Tchiauri 1 and 2 sites suggests local production, and fits well in the regional framework of the Kakheti region. Although some common elements, such as rim and base types, decoration techniques and patterns, can be observed, it differs significantly from the contemporary pottery production of other areas of Eastern Georgia, such as Shida Kartli, where our team previously worked (at Natsargora and Aradeti Orgora). One notable distinction is the higher frequency of rather coarse, heavily mineral-tempered wares at Tchiauri 1 and 2, along with the rarity of burnished items. On the contrary, we noticed strong similarities in shapes

and ware groups between our findings and those from nearby sites like Nazarlebi (Bukhrashvili et al., 2019, 2020) and Didi Gora (Korfmann et al., 1999), which could be considered roughly contemporary with Tchiauri 1 and 2. However, a significant difference between our sites and Nazarlebi is the absence, at our sites, of obsidian-tempered pottery.

Some features are also shared with pottery from Udabno (Betram, 2008), although the latter appears to be slightly later than the material found at the Tchiauri sites. Further analysis of the sherds may aid in determining the precise date and cultural affiliation of our assemblage by identifying more specific parallels. Nevertheless, the lack of complete vessels, the high fragmentation rate of the sherds and the scarcity of well-stratified recovery contexts may pose challenges in establishing a comprehensive regional ceramic sequence solely based on these factors.

The study of the survey pottery allowed for a better definition of the regional ceramic diagnostics of the different chronological periods: Chalcolithic, Middle Bronze Age, Late Bronze Age, Iron Age, Hellenistic and Medieval –post-Medieval. It was therefore confirmed that the main periods of occupation of the investigated area correspond to the Chalcolithic, Late Bronze, Hellenistic/Late Antiquity and Medieval/Modern Age.

The analysis brought to the following results about the chronology of individual sites:

- LS094 (situated in the field north of the Tchiauri 1), yielded material spanning from the Chalcolithic era to the Medieval period, although the bulk of the pottery can be attributed to the Late Bronze Age and to the Middle Ages;
- Comparable results, with the majority of recovered pottery dating to the Late Bronze Age and Medieval periods, were obtained from LS095 (situated in the field southwest of Tchiauri 1 and west of Tchiauri 2).
- Some pottery dating to the 14th century AD was recovered at LS100 (located to the E of the Heretiskari bridge on the Alazani River) yielded pottery
- LS101 (a probable two-mound settlement in a cultivated field approximately 2 km southwest of Tchinchirianis Gora) mostly yielded pottery Late Bronze Age pottery, with more sporadic evidence of the Chalcolithic, Middle Bronze Age, and Medieval periods.
- LS103 (a circular mound in a recently cultivated field in the Ananauri area) yielded pottery of the Middle Bronze, Late Bronze Age and Medieval period.

During the 2023 excavation campaign, Gaia Babolin concluded the analysis of the macro-lithic tools recovered from the survey conducted in October 2022 in the Lagodekhi area (**Fig. 4**). The assemblage consisted of 20 items: 4 handstones (20%), 6 grinders (30%), 1 pounder (5%), 2 polishers (10%), 1 axe (5%), 2 pestles (10%), 2 grooved abraders (10%), 1 grinding tool (5%), and 1 arrowhead (5%). Most of them come from site LS094, which, along with the ceramic remains found, presents a variety of occupation phases.

Besides drawing, photographing, describing and classifying, the analysis involved microscopic examination of use-wear traces using a low-resolution stereoscopic binocular microscope with magnification ranging from 10x to 40x. For each artefact, topography, roughness, and use-wear traces such as sheen, striae, levellings, and detachments were described.

The overall preservation condition of the artefacts is good, even though they were predominantly discovered in a fragmented state. The raw materials used for their manufacture were primarily from alluvial deposits, and consisted of igneous (85%) and sedimentary rocks (15%). The majority of the tools were employed in food production activities (65%) the rest consisted of tools used in craft production (35%).

Grinders (30%) exhibit a loaf-shaped plan and an ovoid or flat/convex section. Technological traces, such as pecking, are visible on the sides. The active surface shows use-wear traces in the form of striae, resulting from back-and-forth movements against a lower tool for grinding activities.

Handstones (20%) are characterized by one or two parallel and flat working surfaces. Their morphology varies from loaf-shaped in plan and quadrangular in section to spheroid-shaped.

Technological traces in the form of pecking are visible on the sides, facilitating handling. Use-wear traces suggest multidirectional movements against a lower tool and short-distance percussion.

Pestles (10%) are quadrangular or ovoid in plan and ovoid in section. They have one active surface with traces of pecking.

Only one example of pounder was found (5%). It is cuboid in shape and exhibits pecking on the sides (approximately 50% of the piece). It was reused as a grinder, featuring three working surfaces with traces of grinding activities (striations). One side of the piece is fragmented.

Grooved abraders (10%) come in various shapes, ranging from irregular in plan and section to elongated in plan and circular in section. They have one working surface with abrasion traces, including grooves measuring from 2 cm to 6.4 cm in length. These tools are associated with craft production activities.

Polishers (10%) are irregular in shape, with one or two working surfaces displaying traces of polishing (striae).

Finally, only one axe was found (5%), quadrangular in plan and section. It is polished on all sides, while the butt is rough, possibly intended for inserting the hafting. The bit (working edge) shows use-wear traces in the form of detachments. The bit is not overly thin or sharp, leading to the interpretation of this object as potentially being a pestle as well.



Fig. 4. Gaia Babolin analysing groundstone tools in the expedition house

GEO-ARCHAEOLOGICAL RESEARCH IN THE LAGODEKHI MUNICIPALITY (GIOVANNI BOSCHIAN, LEVAN NAVROZASHVILI)

No sites older than about 5000 BC were put into evidence by extensive and intensive archaeological survey in the Lagodekhi area of the Alazani plain. Assuming that archaeological surveys do really represent unbiased site distribution versus chronology in the area, the most straightforward explanation of this peculiarity is that the area was not peopled in older times. It looks however unconvincing that a wide plain area, probably rich in water and highly suitable for agriculture was not colonised already by Neolithic groups. Geoarchaeological observations carried out in the area suggest alternatively that high depositional rates of river sediments may have characterised the area prior to 5000 BC, whereas fluvial sedimentation decreased dramatically after the Early Bronze Age. Even if there is evidence (sondages by G. Boschian in 2021 the Ananauri area) that kurgan features were built on a soil that is shallow (< 1 m depth), implying that modest amounts of river sediments accumulated subsequently, the whole area is clearly overflowed and consequently indicates that depositional rates had been much higher in previous times. Though the timing of this deposition is currently still unknown, it may be hypothesised that it may have happened before 5000 BC and after the Neolithic peopling of the area. This hypothesis is corroborated by high depositional rates (about 6000 BC at 6.5 m depth) occurring in the higher Alazani valley near Akhmeta (von Suhodoletz et al., 2018 <https://doi.org/10.1177/09596836177355>).

In order to test this hypothesis, six geognostic cores were drilled by Giovanni Boschian and Levan Navrozashvili, assisted by different members of the team in the Alazani plain, between July 2nd and July 17th, between the river and the extreme southern toe of the alluvial fans that border the Greater Caucasus range.

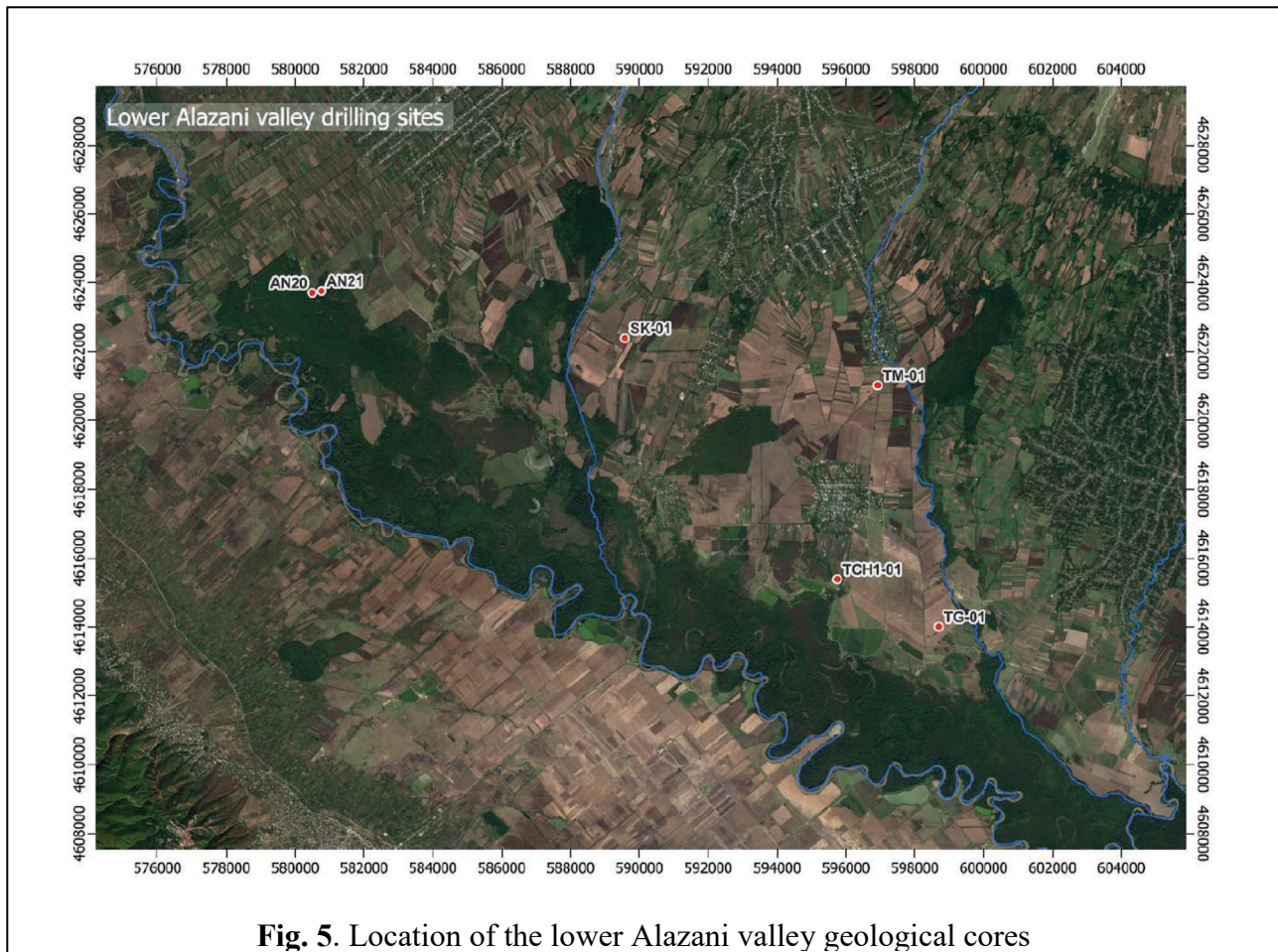




Fig. 6. Levan Navrozashvili drilling core AN_20

The aim of the drillings was to ascertain the thickness of the alluvial sediments underlying the excavations carried out in the last years, and to possibly collect organic samples that may be radiocarbon-dated in order to compute the depositional rates in the plain. The drilling sites (**Fig. 5**) were chosen in order to form one transect approximately along the river course, and two other ones transversal to the Alazani valley.

Fenestered cores 65 mm wide were hammered into the sediments by Atlas-Copco Cobra jackhammer, and extracted by hydraulic extractor (**Fig. 6**).

Samples for pollen analysis were collected every 5 cm, whereas bulk samples for sedimentology and geochemistry were collected by averaging over 10 cm thickness, interrupting the averaging at the observed lithological limits.

Ananauri forest area (**Fig. 7**, left)

Two cores were drilled in proximity of Ananauri Kurgan 9. AN_20 site is situated few tens of metres from the entrance gate of the forest, whereas AN_21 site is located about 30 m NW of the kurgan, beyond the area where cobbles rolling down the feature have accumulated.

Tchiauri-Tsiteligorebi area

Two cores were collected in proximity of two Early Chalcolithic resp. Late Bronze Age sites excavated in the last few years. Site TCH_01 is located about 30 m to the west of the Tchiauri 1 main mound, whereas site TG_01 was set about 120 m WSW of the Tsiteli Gorebi 5 main mound, in the lowest locus west of the site.

Tamariani area

This locus (site TM_01) is situated off any known archaeological site, a few hundred meters S of the village of Tamariani. Its purpose was to observe the characteristics of the alluvial sequence in an area more to the north and off the current course of the river.

Saqobo area (**Fig. 7, right**)

The purpose of drilling in this area (Site SK_01) was approximately the same as the previous one, in an area more to the west and close to the extreme southern extent of the alluvial fans.

Other sedimentological tests were carried out by hand augering in the area of Ananauri Kurgan 9, following geomagnetic anomalies. Among them, one transect of 11 coring (AN-T02) was located approximately parallel to one of the kurgan radii.

Preliminary observations carried out on the extracted cores show that the sediments of the lower Alazani plain are remarkably homogeneous. Most of the sequences are composed of silt mixed with few fine sand and minor amounts of clay, intercalated with very few layers of medium sand that is sometimes laminated. Some dark, organic matter-rich layers occur usually at 1 to 2 m depth in some of the cores, and more rarely at 8 to 10 m, indicating initial formation of soils or deposition in low eH environments. Waterlogging with formation of redoximorphic features affects all cores but SK_01. Remarkably, only core SK_01 is mostly characterised by the deposition of sand and, at the bottom depth of about 7-8 m, of dark grey/blackish clay.

Preliminary interpretation of these data suggests that the area was characterised by river deposition, possibly with formation of lakes and occasional overflowing, prior to 6 ka BP. However, depositional rates cannot be assessed until radiocarbon ages of the dark layers are available.

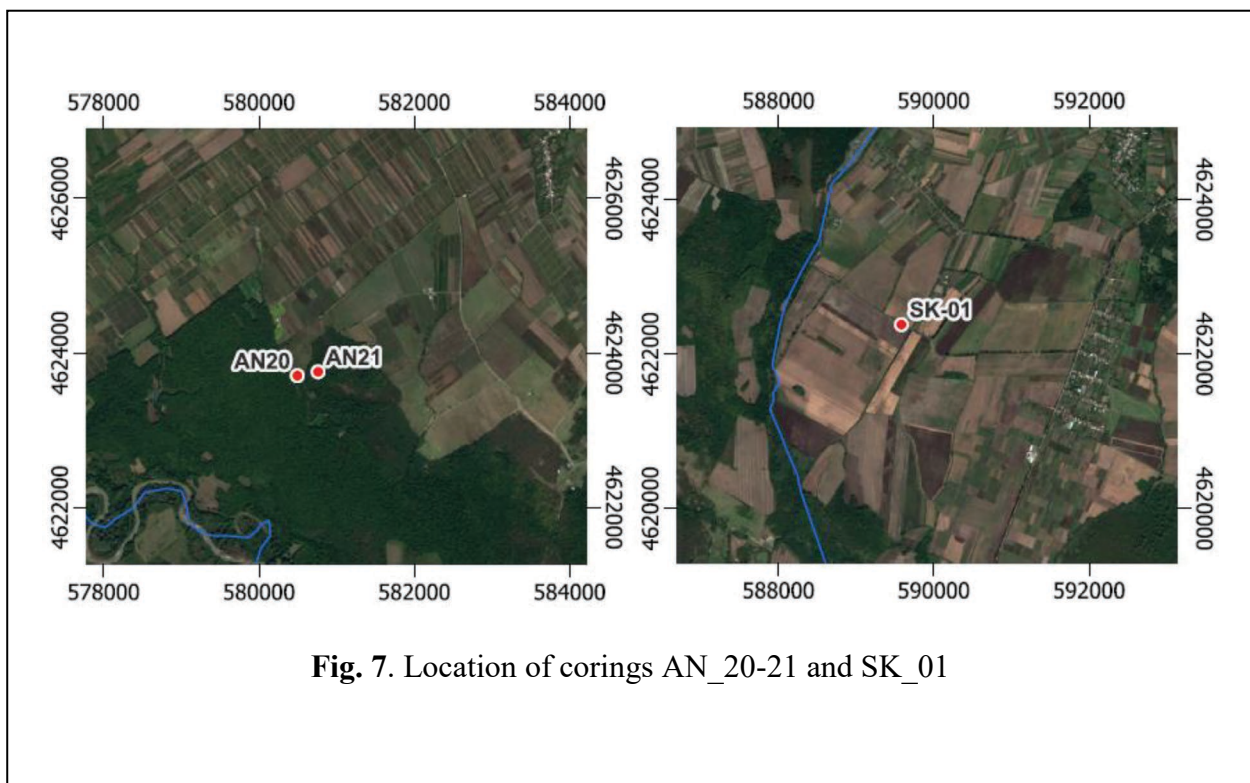


Fig. 7. Location of corings AN_20-21 and SK_01

DISCOVERY OF A NEW SITE OF THE LAGODEKHI SURVEY

During the preliminary survey carried out for selecting the locations of the cores, a new kurgan site was located in the vicinity of the Ananauri cluster, at the northern limit of the latter. The new kurgan is apparently aligned with kurgans LS35, LS34, LS004, LS097, and LS066. It was added to the list of the Lagodekhi survey sites with the name LS106 (= Ananauri kurgan 24).

GEOMAGNETIC PROSPECTIONS AROUND ANANAURI KURGAN 9 (LENA LAMBERS)

Between July 11th and July 17th Lena Lambers (GAIA prospections, Leiden) performed geomagnetic prospections around Ananauri kurgan 9 (site LS034, UTM 38 T 580785 E 4623749 N, alt. 236 a.s.l.). This belongs to the large cluster of monumental Bedeni barrows located in the forest to the south of the present Ananauri/Onanauri village. More specifically, it belongs to a NE-SW oriented alignment of burrows (**Fig. 8**) one of which (LS004 = Ananauri Kurgan 3) was excavated in 2012 by a Georgian team (Z. Makharadze et al., *Ananauri Big Kurgan n. 3*, Tbilisi 2016) and another one (LS035 = Ananauri Kurgan 10) had been subjected to geomagnetic prospections in 2021 by a joint Georgian-German team.

The aim of the prospection was to investigate the area around the kurgan to find possible surrounding ditches, subsidiary structures that may have stood alongside the kurgan or other traces of occupation connected with a contemporary or later ritual frequentation of this monumental structure.

For the magnetometer survey in 2023 the Scintrex SM4G-Special Caesium magnetometer in a duo-sensor and total-field configuration was used (**Fig. 9**), a handcrafted frame by Walter Laan. The probes were carried ca. 30 cm above the uneven ground at a sampling rate of 25 x 50 cm. The application of this magnetometer with a sensitivity of ± 10 pt in the uncompensated total field configuration allowed us the maximum utilisation of the magnetic anomalies.

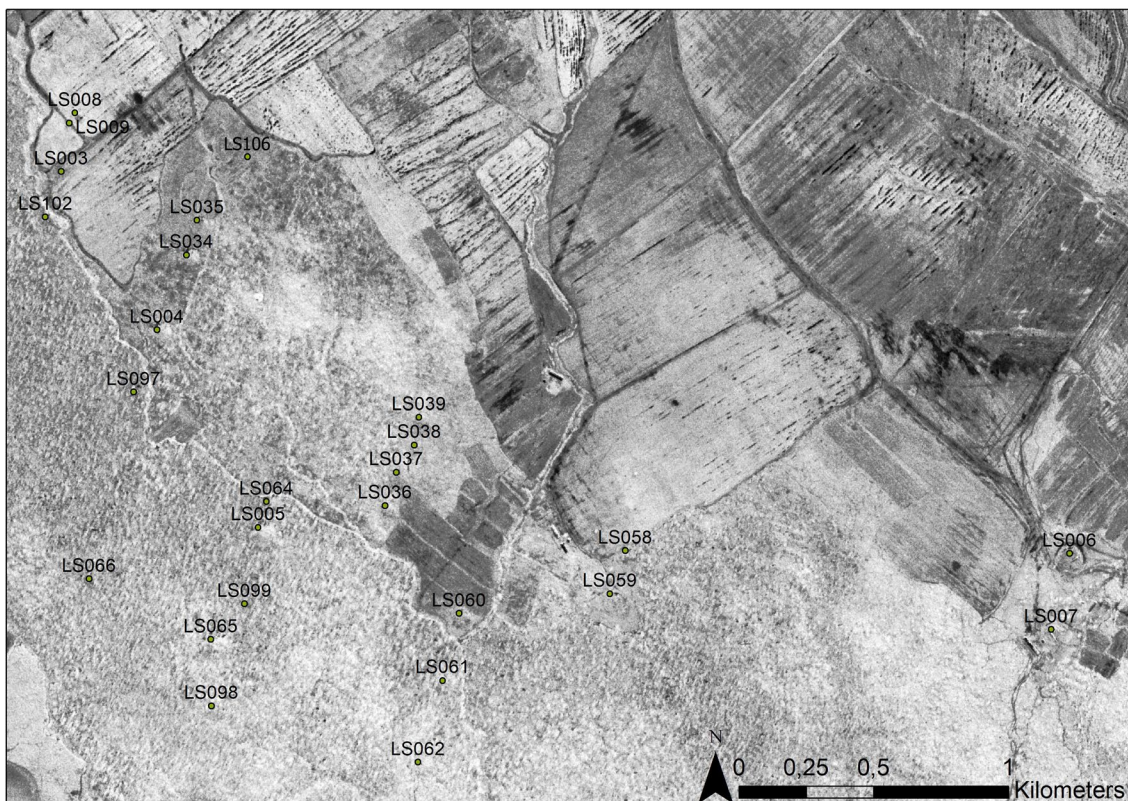


Fig. 8. Lagodekhi survey: Corona satellite image showing the kurgan alignments in the Ananauri region

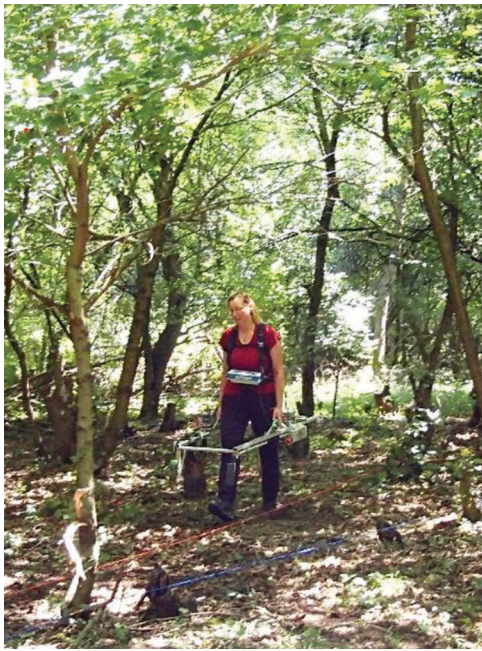


Fig. 9. Lena Lambers with the Scintrex SM4G magnetometer on site

The total Earth's magnetic field at Ananauri in July 2023 was 49800.00 ± 10 nT. The forest area of the Ananauri kurgans has an average distance between the trees of around 2 to 10 metres. In order to carry out the survey, underwood has been removed. Nevertheless, trees had to be bypassed regularly, which leads to greater inaccuracy in the data.

The data were stored as binary files on the read-out unit and downloaded via WBinDump. The data was split and transformed into ASCII files with Smartdat and Resam2 DOS-programs. For image processing and further data treatment, we applied the programmes Geoplot (Fa. Geoscan Ltd., UK) and Surfer (Golden Software, USA).

The investigated area (**Fig. 10**) extended all around the kurgan for a width of 20 m, except for the southern side, where the thick vegetation coverage made it impossible.

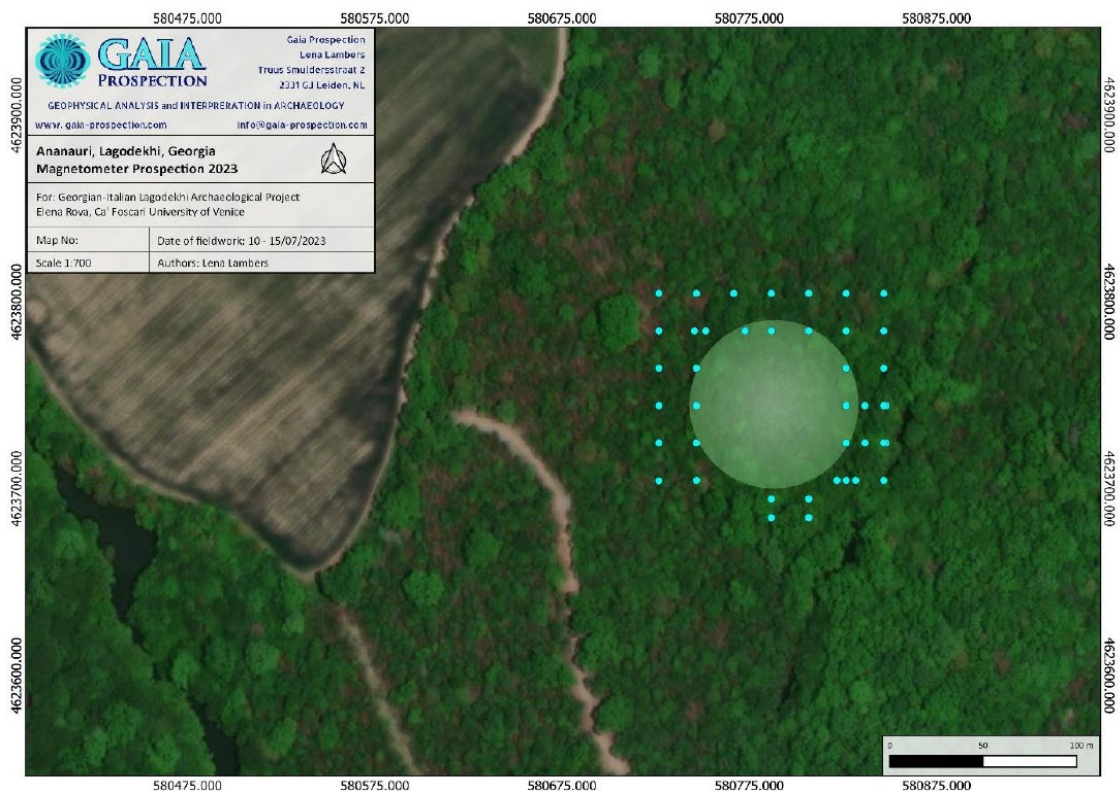


Fig. 10 Approximate location of the kurgan and the measuring grid of the magnetic prospection

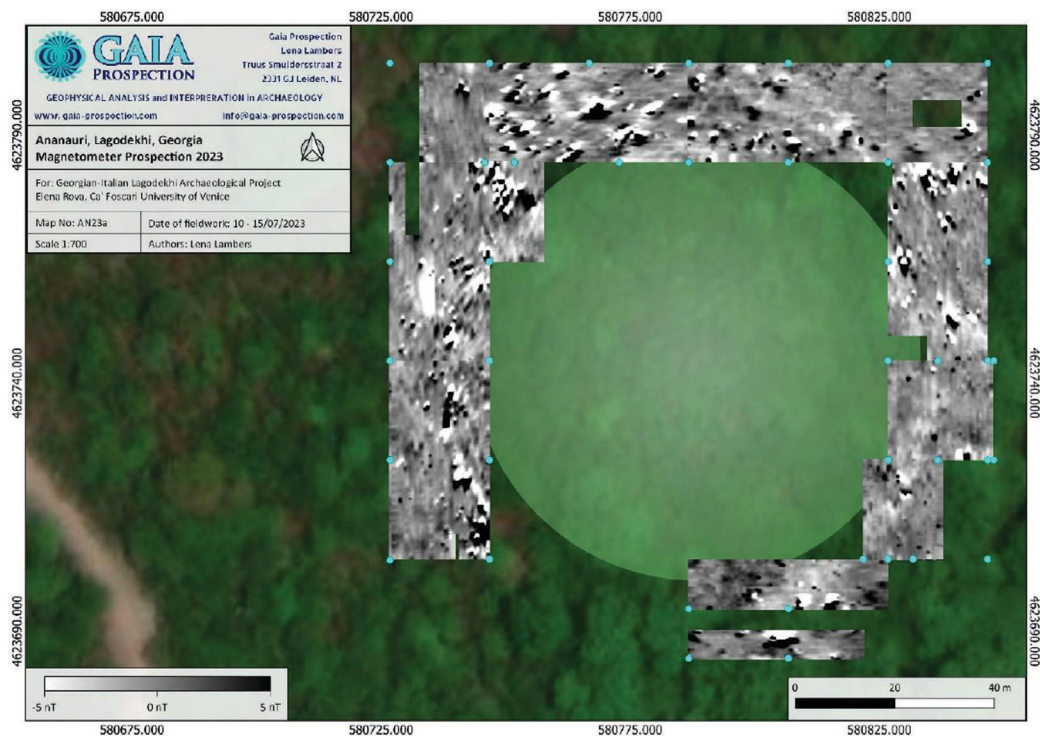


Fig. 11. Magnetic prospection data in a dynamic of ± 5 nT. Smartmag SM4G caesium magnetometer, sensitivity ± 10 pT, duo-sensor configuration, sampling rate 25 x 50 cm, interpolated to 25 x 25 cm

Displaying the data in the range of ± 5 nT shows most of the archaeological features in the ground clearly (**Fig. 11**). The area, especially in the north-west, is covered with metal pieces. Many of these probably derive from the hunting activities around the kurgan, but some of them may hide the location of burials or other small features. A slope in the east is visible in the dataset as negative anomaly. Although we had to evade some trees, the result is a quite smooth survey picture that can be interpreted well.

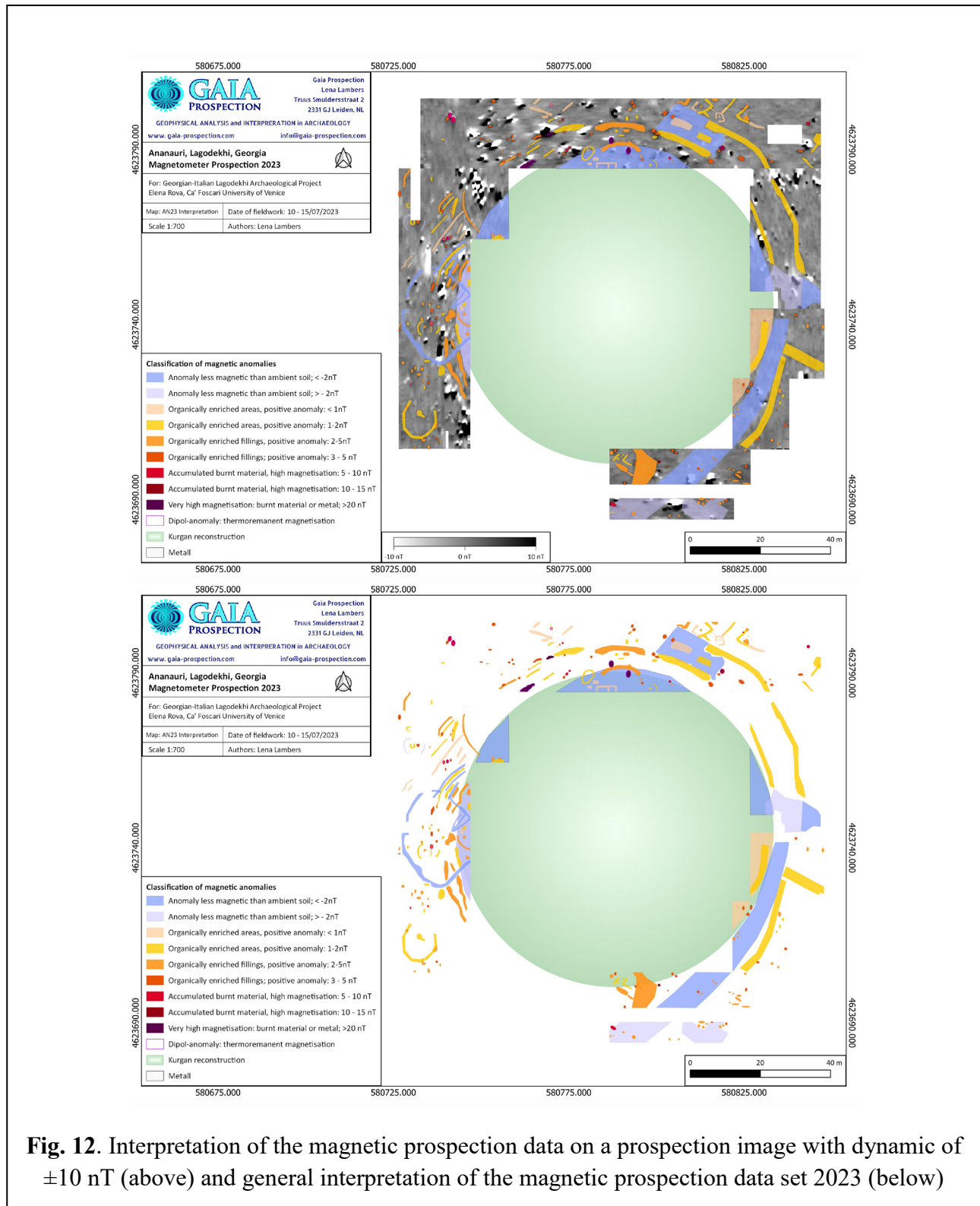
The edges of the kurgan are clearly visible in the magnetic data, mainly as negative anomaly. This changes in the south-eastern part, where they show up as slightly positive. This could indicate a construction method in sections made of slightly different material. Clearly standing out are the two trenches around the kurgan with a signal of 0.3 – 2 nT. They seem to be 1.5 to 2 m wide with a distance from each other of around 6 m (**Fig. 12**). The area between the ditches seems in parts to have a negative magnetisation (visible in the north-east and south-east). In general, the conservation status of the ditches seems best in the north-east, east and south-east. The ditches are in size and signal strength comparable with the ditch of Ananauri 10, that were discovered in a magnetic prospection in 2021 (unpublished DAI Report 2021, M. Parsi, J. Fassbinder, LMU Munich)

In the south-east a positive anomaly, 11 m long and 3 m wide, might be tentatively interpreted as a road leading to the kurgan. Similar roads have been found at early 2nd millennium kurgans on the Trialeti plateau. Their existence has been hypothesised, but not yet proved, for the barrows of the Early Kurgan period (second half of the 3rd millennium BC) to which the Ananauri group is supposed to belong. The “road” seems to continue outside the measurement area.

In the western part of the surveyed area there are several scattered lines, whose direction is similar to that of the ditches, but a clear continuation of the latter is not visible. What shows up clearly in the western part is an oval linear structure with a diameter of 20 – 25 m and a negative

magnetisation. Several walls or ditches with magnetisation of 0.5 – 2 nT, all of which have the same north-east - south-west orientation, also catch the eye. They appear in the northern part, but a few of them can also be found in the southern foothills of the kurgan.

Finally, there is a larger amount of round and oval pits around the kurgan. Some of these are surrounded by ring-shaped anomalies, which could indicate graves. Some of them, with a signal strength of 10 nT and higher, could contain burned material but they might as well just be further metal pieces. **Fig. 12** shows a preliminary interpretation of the geomagnetic data.



ACTIONS TOWARD GROUNDTRUTHING THE RESULTS OF THE GEOMAGNETIC PROSPECTION

In order to try to verify the results of the geomagnetic prospection, we first of all carried out geological hand-auger tests at several locations around the kurgan (see above, geo-archaeological research in the Lagodekhi Municipality). By these we established that the modern humus had a varying depth between 5 and 15 cm, and that the sediments under it consisted of yellowish lime of alluvial origin. At some locations, the sequence of alluvial sediments appeared to be interrupted, around a depth of -70 -80 cm from the surface, by a soil, which we tentatively connected with the phase of use of the kurgan.

In order to verify this hypothesis, we selected three areas (**Fig. 13**), which looked especially promising for excavating small size sondages:

- no 1: a 20 m long, 1 m wide area oriented SW-NE radiating from the base of the kurgan, in the NE part of the prospected surface, which should intercept both of the two supposed ditches in the area where they were most clearly visible in the geomagnetic image;
- n. 2: a 5 m long, 1 m wide area oriented NS on the western side of the kurgan, by which we hoped to intercept the NW-SE oriented positive anomaly that might have corresponded to a road leading to the kurgan;
- n. 3: a square area measuring 2 x 2 m located approximately in the centre of the oval linear structure with a diameter of 20 – 25 m and a negative magnetisation, where a vague smaller circular anomaly (diameter less than 5 m) was also visible.

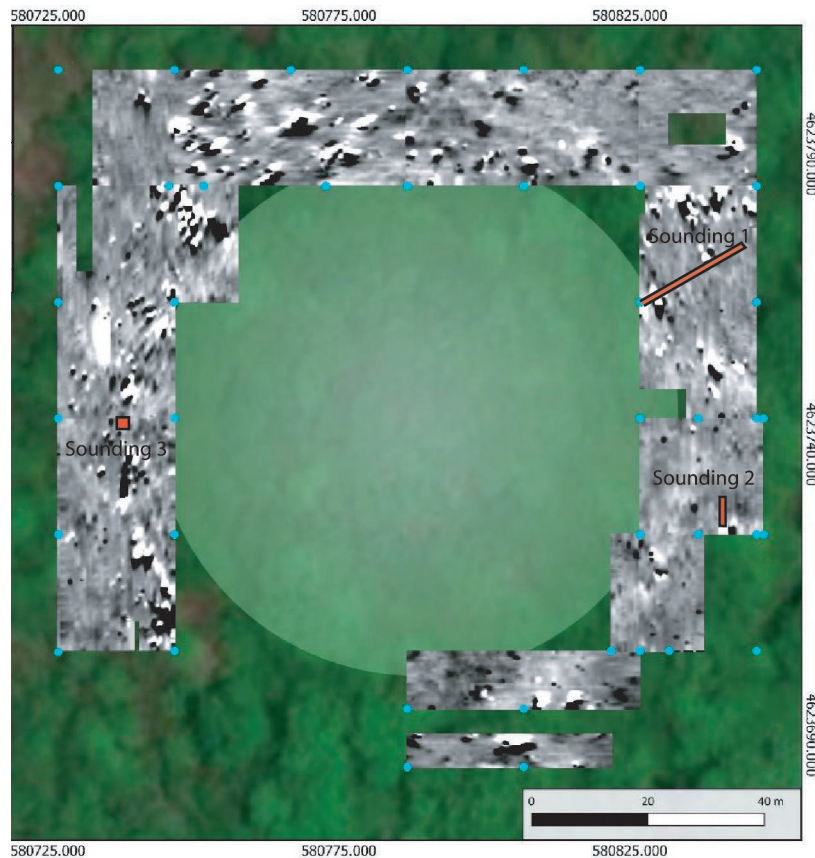


Fig. 13. Location of the three areas selected for future soundings



Fig. 14. View of the area of Sounding no. 1 after removing surface soil, from SW

Unfortunately, time was too short for obtaining an excavation permission for the said areas, on which we therefore limited ourselves to remove the surface soil and clean and document any feature emerging under it. We thus verified the depth of the humus layer (between 5 and 15 cm) and confirmed that the top of the underlying lime layer was still heavily disturbed by the roots of recent trees.

In area no. 1 (**Fig. 14**) we also ascertained the presence of scattered stones extending from the supposed outer limit of the kurgan for ca 3 m, approximately down to the limit of the supposed inner ditch. Interestingly enough, the position of these stones was not completely random, but some of them seemed to form circular features with a diameter of about 1 m, as if they may hide, for instance, the location of small later graves. A vague discontinuity in the colour and consistence of the sediments, ca 50 cm wide and oriented roughly NS, was also observed to cross the trench ca 5 m before its NE limit. This discontinuity may mark the approximate location of the underlying outer ditch highlighted by the geomagnetic prospection.

Scattered stones were also observed in area no. 2, where however they did not seem to belong to the supposed road which, if existing, may be found more than 50 cm deeper. In this case, as well, their position did not seem completely random, and some of them may have belonged to small later features. In area no. 3 as well, some stones were appearing on the bottom of the humus layer, but in this case they seemed to have been moved in recent times from their original position.

To sum up, we can conclude that whatever structure of the second half of the 3rd millennium BC the prospection may have highlighted, it must be buried under a layer of at least 50 cm of apparently sterile alluvial sediments and cannot therefore be confirmed without a proper excavation.

WORK AT KARELI MUSEUM (GAIA BABOLIN)

From July 3rd to July 7th, 2023 Gaia Babolin, assisted by Michela Ferracin, carried out a week-long on-site study at the Kareli Museum, dedicated to the initial study of the macrolithic tools from the site of Aradetis Orgora, excavated by the Georgian-Italian expedition between 2013 and 2016, which are currently housed at this Museum. Approximately 130 objects, accounting for about half of the total corpus (2014 and 2016 seasons), were studied and classified during this research period. We estimate that another similar study period will be necessary, in the future, in order to complete the analysis of the site's assemblage. All collected data will be used in a future functional study of the macrolithic tool assemblage from different Georgian sites.

The objects were classified, entered into a dedicated database, and documented with new photographs and drawings (as for the items, for which the iconographic documentation carried out at the time of the excavation was not considered sufficient for a specialised study). For each tool (78 in total), a cast was taken using Vestige Fast light in order to document the traces of use on the working surfaces (Fig. 15). These were then subjected to microscopic analysis by the stereoscopic binocular microscope provided by the mission.



Fig. 15. Michela Ferracin taking casts of the working surfaces of the groundstone tools from Aradetis Orgora at Kareli Museum

The features of the surfaces of use (topography, roughness) and such traces as sheen, levellings, striae, and detachments were observed. Whenever possible, samples of residues were collected from the most promising objects using tweezers and spatulas, and stored in test tubes for future palynological analysis. Ten grinding stones or hand mills were also selected for pollen analysis, which will be carried out in the future at the GNM by prof. Eliso Kvavadze if permission to temporarily move the objects to Tbilisi, which we have in the meanwhile requested, will be granted.

The preliminary analysis of the Aradetis Orgora macro-lithic tools leads to the following observations: the tools are in a medium-to-good state of preservation, and approximately 42.6% of them are complete. The raw material used likely came from local fluvial deposits. It predominantly consists of igneous rocks (56.5%), including basalt (49.2%) and granite (1.6%) as well as unidentified materials (5.7%); and sedimentary rocks (43.4%), including sandstone (40.16%), limestone (2.4%), and flint (0.8%).

The studied objects, totalling 122, include grinders (23.7%), querns (9.8%), grinding tools (18%), handstones (8.1%), pestles (4%), a mortar (0.8%), working slabs (2.4%), abraders (1.6%), polishers (4.9%), a hammer (0.8%), crushing tools (4.1%), axes (4.1%), chisels (1.6%), worked cobbles (4.9%), perforated tools (7.3%), building stones (2.4%), and one flake (0.8%).

The majority of the items originate from archaeological contexts dated to the Late Bronze Age, with a few specimens dating back to the Kura-Araxes or, respectively, Early Iron periods.

The majority of the tools were dedicated to food production (64.7% of the total), with querns and grinders being more prominent than pestles and mortars, a fact that indicates a preference for grinding rather than pounding actions.

Querns and grinders (51.6%) exhibit similar features, suggesting a certain level of specialisation in their production. They are made of vesicular, coarse-grained, and medium-textured basalt. They are ovoid or quadrangular in plan and plano-convex or saddle-shaped in section (concave-convex in both section and plan). Technological traces such as pecking and polishing are visible on the ventral surface (the unworked surface) and sides. The surface of use is levelled, displaying use-wear traces in the form of striae, predominantly unidirectional and parallel to each other, of medium length and depth, with a spread of sheen all over the surface, which appears shiny or greased. The topography is jagged/irregular, with rounded asperity.

Grinders are elongated, ovoid in plan, and plano-convex (or semi-circular) in section. They were used with both hands in back-and-forth movements and represent the standard typology of the Late Bronze Age for these tools. They were manufactured using coarse sandstones, calcareous sandstones, and compact vesicular basalts. Technological traces (pecking) are recognised on the back and side edges to ensure a better grip.

Pestles, ranging from 9 to 22 cm in length with one small-sized exception, are characterised by a single use surface with traces of pecking. Mortars were not found, except for one small-sized example.

Crushers and crushing cobbles were also identified. They are approximately ovoid in plan and plano-convex in section, featuring a central hole with pecking traces. Technological traces such as polishing and pecking are visible. The topography is irregular, with rounded asperity, and there is a spread of sheen all over the surface. The latter appears opaque, particularly in the lower part of the topography. Striae and pecking are present.

Different perforated tools interpreted as weights or spindle-whorls were also recognised. They include blank pebbles, ground to a small discoidal preform (approximately 28-30 mm in diameter) with even thickness (about 12 mm). The perforation is always centrally placed, and two opposed drill marks are visible on it.

In conclusion, the research conducted on the macrolithic objects from the site of Aradetis Orgora during the Late Bronze Age provided significant insight into their production and use, primarily focused on grinding tools. However, it is important to note that the study is still incomplete, as objects from the remaining two excavation years are yet to be analysed. The forthcoming palynological analysis will contribute additional considerations to our understanding of these

artefacts, enabling us to obtain a more detailed overview of the role and significance of macrolithic objects within the archaeological context of Aradetis Orgora during the Bronze Age.

PRELIMINARY SURVEY OF THE HUMAN OSTEOLOGICAL REMAINS FROM MEDIEVAL MONASTERIES IN THE BORJOMI REGION

During the second half of July prof. Francesca Bertoldi, accompanied by Piera Allegra Rasia (Ca' Foscari University), and prof. Pier Francesco Fabbri (Università di Lecce), spent 15 days between Tbilisi and Borjomi, hosted by prof. Lia Bitadze of Tbilisi State University. Besides carrying out didactical activities for the students of Ivane Javakhishvili State University in the framework of an Erasmus + ICM teaching staff mobility, the team of palaeoanthropologists visited three Medieval monasteries in the Borjomi gorge of the Samtskhe-Javakheti region of southern Georgia (Potoleti, Green Monastery, and Berisaqdrebi = Bertasakhtavi = Churches of the Monk, Kvibisi village) (**Fig. 16**). According to a preliminary study by G. Laghiashvili and G. Mtskeradze, the monasteries date to the 9th-10th centuries and were destroyed in the 16th-17th centuries AD.

On this occasion, the team carried out a preliminary survey of three extremely important assemblages of human osteological remains from the monasteries' crypts, corresponding to several hundreds of individuals, as a preparatory step for a larger publication project to be developed in the future in collaboration with prof. Liane Bitadze of Tbilisi State University (**Fig. 17, Fig. 18**).

Three of the skulls were transported in Tbilisi, where they were scanned by Mirea Peruzzi on July 26th-28th with the 3d laser scanner of the GILAP expedition. Finally, a visit to one of the monasteries was paid by members of the GILAP team on July 29-30th.

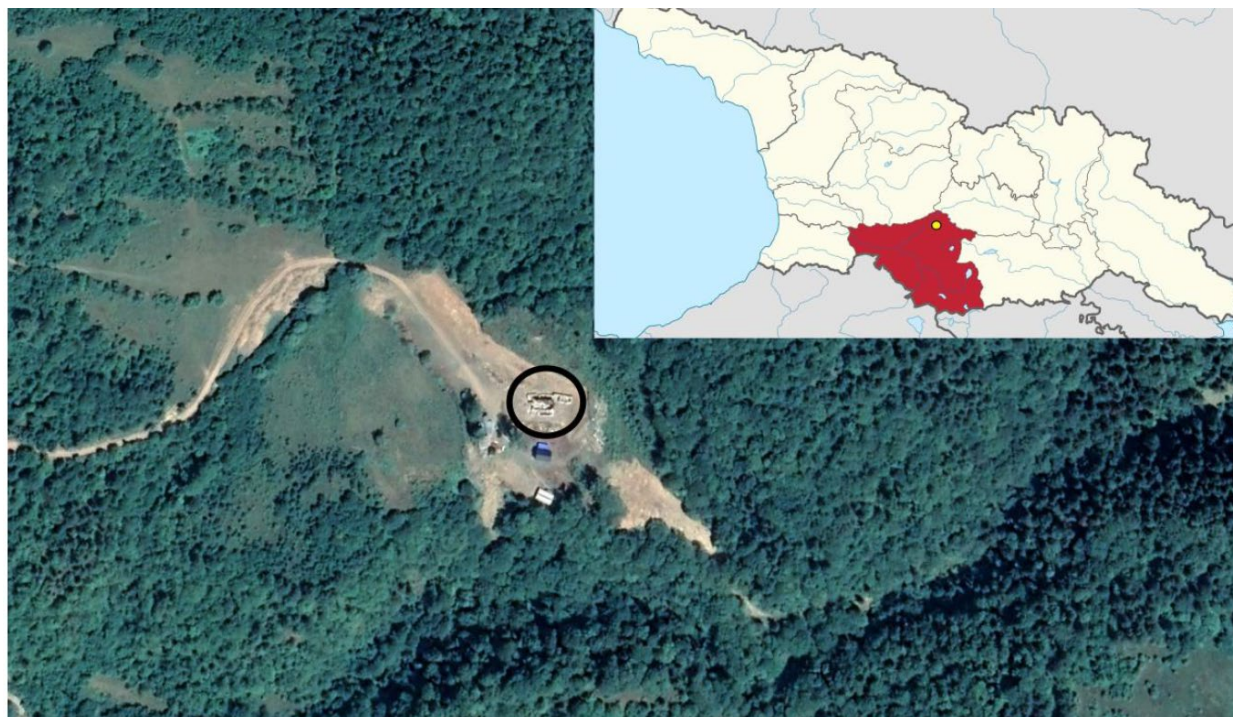


Fig. 16. Approximate location and satellite images of the Berisaqdrebi = Bertasakhtavi = Churches of the Monk monastery



Fig. 17. Osteological material from the crypt of Berisaqdrebi monastery in its original context



Fig. 18. F. Bertoldi, P.F. Fabbri and P.A. Rasia analysing the human remains from the Borjomi gorge Medieval monasteries

ETHNOGRAPHIC RESEARCH ABOUT ANIMAL HUSBANDRY AND TRANSHUMANCE PRACTICES IN KAKHETI REGION

From the beginning of the season to July 17th, Massimo Mirabella carried out some preliminary research for his MA thesis in Cultural Anthropology about animal husbandry practices and pastoral mobility in Kakheti region, focusing on transhumance routes between Kakheti and Tusheti. The study involved three different activities:

- 1) meetings with local authorities who supervise the sheperds' activities and with local anthropologists working at the Giorgi Chitaia Ethnographic Museum in Tbilisi;
- 2) identification and geo-localisation of the transhumance routes between Kakheti and Tusheti;
- 3) visit to Tusheti following the traditional route from the Shiraki plain to Tusheti through the Abano pass (2700 m a.s.l.), visit to the sheperds' summer camps at Dartlo e Bochorna, with preliminary interviews with some transhumant shepherds, carried out with the help of a local interpreter (**Fig. 19**)

In connection with Mr. Mirabella's research, on July 8th-10th part of the GILAP team paid a short visit to Tusheti.



Fig. 19. M. Mirabella at Bochorna (above), view of the sheperds camp at Bochorna (below).

SAMPLING FOR RADIOMETRIC DATING, ARCHAEOLOGICAL AND TRACE ANALYSES AND PALAEOENVIRONMENTAL RESEARCH

This year we finally received the permission from the National Agency for Cultural Heritage Preservation of Georgia for exporting to Italy the samples we collected during last year excavation season. These include:

- 28 samples of organic remains for ¹⁴C analysis (to be analysed by dr. Elisabetta Boaretto, Weizmann Institute of Science, Rehovot, Israel) from Tchiauri 1 and 2, as well as from the geological drillings carried out in the Alazani plain. They will hopefully provide a precise date for the two sites within the sequence of the local Late Bronze/Early Iron Age cultures, and more precisely dating the sequence of alluvial levels and the changes in the course of the river and its tributaries compared to the different episodes of human occupation.
- 20 obsidian samples from Tchiauri 1, to be analysed for provenance determination by Prof. Bernard Gratuze at the Institut de Recherche sur les ArchéoMATériaux, Centre Ernest-Babelon CNRS/Université d'Orléans, France;
- 18 samples of undiagnostic pottery sherds from the site of Tchiauri 1 to be submitted to archaeometric analyses by Prof. Lorenzo Lazzarini at Ca' Foscari;
- 21 fragments of animal bones of common domestic animals from Tchiauri 1, to be submitted to stable isotope analysis for palaeonutritional and mobility studies by prof. Paola Iacumin at Parma University (Italy).

In the course of the 2023 activities we collected numerous samples, the analysis of which will be carried out in Georgia. They include:

- 3 palynological samples from sediments trapped on the surface of macrolithic tools from the Aradeti Orgora 2013-2016 excavations, to be analysed in Tbilisi by Prof. Eliso Kvavadze, GNM. We also selected 10 groundstone tools from the same site to be analysed by this scholar at the GNM if permission for temporarily moving them to Tbilisi will be granted;
- Palynological samples from the deep geological corings carried out by G. Boschian and L. Nazvrozashvili in the Alazan plain (to be jointly analysed in Tbilisi by E. Kvavadze and by experts of Ilia State University);
- Samples of sediments from the deep geological corings carried out by G. Boschian and L. Nazvrozashvili in the Alazan plain, to be analysed for composition, granulometry etc. by experts from the Laboratory of Ilia State University.

Finally, 78 casts of the working surfaces of macrolithic tools from Aradeti Orgora (excavations 2013-2016) were taken by Gaia Babolin using Vestige Fast Light with the aim to perform use wear analysis on them in a future functional study of the macrolithic tool assemblage of these sites.

DIDACTICAL ACTIVITIES

The GILAP team continued the program of didactical and dissemination activities for the local public which was started in 2019. The target of this year lessons were high school students (age 14-18) from the Apeni village. On 29/06 they were given an introductory seminary about archaeology and excavation techniques at the expedition house. The seminary comprised a lecture and hands-on experiments: the students were tasked with excavating their own "site": a box prepared in advance with different soil types, structures, and artefacts hidden in the sediment. They had to apply what they had recently learned in the lecture and excavate their box, paying attention to stratigraphy and record keeping. This activity was organised and carried out by Giga Bakradze and Michela Ferracin (**Fig. 20**).



Fig. 20. Didactical activities for the youth of Apeni: theoretic and practical lessons by Michela Ferracin (above) and Giga Bakradze (below)

RESULTS AND FUTURE PERSPECTIVES

The 2023 season of the GILAP project was very successful and in fact represented a benchmark in the activities of the Ca' Foscari team in Georgia. Indeed, it allowed to complete the documentation of the research carried out during the last five year in the Lagodekhi Municipality and to further progress toward the final publication of the excavations carried out in Shida Karli between 2013 and 2016.

The main results of this year activities concern the collection of data about the sedimentological history of the Alazani plain. Together with the data from the archaeological survey of the municipality carried out in 2018-2022, these will allow to better understand the peculiar pattern of human occupation of this part of Kakheti in the late prehistory.

The preliminary results of the geomagnetic prospection carried out around Kurgan no. 9 at Ananauri confirm that the surroundings of these monumental barrow graves were the seat of much more complex ritual activities than hitherto suspected, and thus open new research perspectives about their use in the course of time.

Finally, the period of the field season was used to establish new contacts with local scholars, which will hopefully lead to the implementation of future cooperation projects

Acknowledgements

Thanks are due to the National Agency for Cultural Heritage Preservation of Georgia for granting us the permission to export samples from the 2022 season excavations at Tchiauri 1 and 2; to the Lagodekhi Regional Department of the Ministry of Culture, Sport and Youth for inviting us to work in the region and to the Italian Embassy in Tbilisi for their constant support to other activities.

We are also very grateful to Mr. Dimitri Ramishvili (Director of the Kareli Local Museum) who allowed us to study the finds from Aradetis Orgora stored in its reserve collections and facilitated our work in several ways, to prof. D. Lordkipanidze, Director of the Georgian National Museum, to prof. Jaba Samushia, rector of the Tbilisi State University, and to prof. Nino Mataradze, dean of the School of Arts and Sciences of Ilia State University, Tbilisi, for the fruitful discussions concerning future cooperative actions.

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