



KEYWORDS: *Post-Palaeolithic rock art – Southern Caucasus – Georgia – Rock engraving*

CAUCASUS IN CONTEXT: CHANGE AND CONTINUITY FROM PRE-HISTORIC TO HISTORICAL PERIODS AT THE TRIALETI ROCK ART SITE COMPLEX

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Abstract. Trialeti is one of the key rock art sites in the Caucasus region. It provides a consistent reference for the rock art heritage of the southern Caucasus. This site offers diverse data to interpret the symbolic production and distribution in the area between Europe and Asia over several millennia. In this paper, we present the results of the most recent investigations carried out in 2022 that reappraise the significance of the Trialeti rock art site within the region. Our investigations focused on the specific area where rock art panels were documented nearly half a century ago. The surrounding landscape, characterised by volcanic-origin non-karstic caves and rockshelters, held significant interest for pre-Historic and Historical societies.

1. Introduction

Rock art research has been sporadically developed in the South Caucasus, although the first discovery of rock art in the region was recorded in the 1880s (Gabunia and Vekua 1980). Since that time, numerous discoveries have been made in this diverse geograph-

ical area, which can be chronologically grouped into four phases: 1) late 19th century; 2) early Soviet (Pre-WWII); 3) Cold War (Post-WWII); 4) independence epoch. These phases encompass decades of research across the three countries of the southern Caucasus: Armenia, Azerbaijan and Georgia (Fig. 1; Table 1).

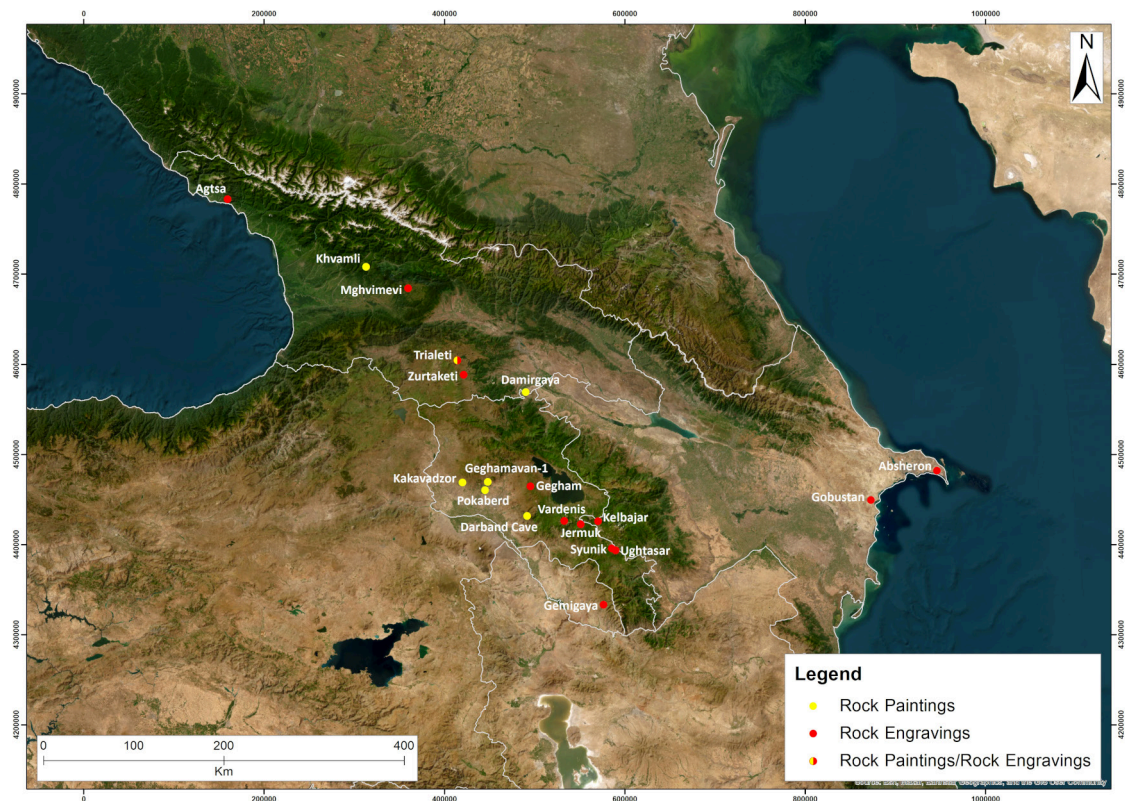


Figure 1. Distribution map of the rock art sites in the South Caucasus (credit: M. Lobjanidze).

Phase	Decade	Armenia	Azerbaijan	Georgia
Late 19 th century	1880s			1881 – Trialeti petroglyphs (Joakimov)
Early Soviet (Pre WWII)	1920s	1920s research acc. to Karakhanyan (1970)		
	1930s		1939 – Gobustan (Jafarzade)	1934 - Mghvimevi (Zamyatnin); 1938 - Agtsa Cave (Solovyov)
Cold War (Post WWII)	Since 1947		1947 – Gobustan (Jafarzade)	
	1960s		1960s - Gobustan (Jafarzade; Rustamov; Muradova); 1966 - declared a State Historical Artistic Reserve of Gobustan	1959–1964 - Zurtaketi Kurgans (Japaridze)
	1970s	1970s - Syunik (Karakhanyan); Gegham (Martirosyan); Darband (Arakelyan)	1970s - Gobustan (Rustamov; Muradova) Apsheron (Aslanov); Gemigaya (Aliyev); Kalbajar (Ismailzade)	1976 - Rediscovering Trialeti (Gabunia)
	1980s		1980s - Gobustan (Rustamov; Muradova)	1981 - Damirgaya (Kiguradze)
Independence Epoch	1990s		1992 - Gamigaya (Aliyev); Since 1995 - Gobustan (Farajova)	
	2000s	2002 - Geghamavan-1 (Khechoyan); 2009 - Pokaberd (Khechoyan); 2009 - Ughtasar (Walking)	2001–2003 - Gamigaya (Museyibli); 2003 - Gobustan 'CARAD' project; 2007 - Gobustan inscribed in UNESCO WHS	
	2010s	2012 - Syunik (Knoll)	2010s - Gobustan (Farajova, Sigari, Shirinli, Abdullayev); 2011 - Azerbaijan (Gobustan) became a member of PRAT	2017 - Rediscovering Damirgaya (Losaberidze); 2017 - Georgia (Trialeti) became a member of PRAT; 2019 - Survey at Trialeti (Cultural Heritage Agency)
	2020s			2020 - Damirgaya (Losaberidze); Georgia (GARA) became a member of IFRAO; 2022 - rediscovering Mghvimevi (Losaberidze, Zavrashvili)

Table 1. Timetable of the main phases of rock art research in the South Caucasus with some of the most important events and discoveries.

Overall, the rock art sites in the South Caucasus exhibit a diverse chronology, beginning with the Upper Palaeolithic (Anati 2001; Losaberidze et al. 2024; Sigari 2013), followed by several Mesolithic and Neolithic rock art corpora (Farajova 2018; Feruglio et al. 2005; Losaberidze et al. 2022) and the largest number of Bronze Age rock art sites (Knoll 2016; Knoll and Meller 2015; Shirinli and Abdullayev 2021; Sigari et al. 2019; Walking et al. 2015). Additionally, evidence of a medieval phase has also been confirmed (Jafarzade 1999; Shirinli and Abdullayev 2021; Sigari et al. 2019).

The most extensive rock art site in the Caucasus, featuring over 6000 images, is Gobustan in Azerbaijan (Anati 2001; Farajova 2018; Shirinli and Abdullayev 2021; Sigari et al. 2019). Other sites in Azerbaijan, such as Kelbajar, Gamigaya and Absheron, remain little known (Aliyev 2003; Aslanov 1972; Farajova 2009). Meanwhile, Armenia hosts the largest number

of rock art sites in the region, primarily concentrated in two areas: central (including the sites Geghamavan-1, Pokaberd, Kakavadzor, Darband, Gegham) and southern (Jermuk, Vardenis, Ughtasar, Syunik) parts. Despite this abundance, rock art research in Armenia has been intermittent (Feruglio et al. 2005; Karakhanyan and Safyan 1970; Khechoyan and Gasparyan 2014; Knoll 2016; Knoll and Meller 2015; Martirosyan and Israelyan 1971; Martirosyan 1981; Walking et al. 2015). Finally, in Georgia, this field has received limited attention, leading to the discovery of fewer sites compared to the other two countries (Gabunia et al. 2019; Gabunia and Vekua 1980; Losaberidze et al. 2022; Losaberidze and Elovshvili 2020).

This paper presents the most recent investigations of the Trialeti rock art site in southern Georgia and explores its extensive corpus of engravings. Trialeti stands out as an exceptional rock art site in the Cau-

casus where both additive (pictograms) and reductive (petroglyphs) techniques are used. However, here, we discuss only petroglyphs, their preservation, figurative themes, superimposition and the archaeological context to introduce a relative chronology from today's point of view.

2. Background

2.1. Discovery and rediscovery

The Fifth Archaeological Congress held by the Imperial Russian Archaeological Society that took place in Tbilisi, Georgia, in 1881 was a clear reflection of the growing interest in antiquities of the Caucasus region. This event was attended by over 400 participants, including the leading European scholars of that day, such as Oscar Montelius, Rudolf Virchow, Heinrich Schliemann, Gabriel de Mortillet, Ernest Chantre etc. (Abulashvili 2018; Sagona 2017).

Later in the 1880s, A. Joakimov, a member of the Caucasus Archaeological Society, made an interesting discovery in Tsalka, southern Georgia, which he reported to the historian E. Weidenbaum:

Merciful tsar, Evgeniy August, it is very unfortunate that you could not come to Tsalka, and here is why: imagine that in the river gorge near the village Tak-Kilisa, I discovered caves with hunting scenes on the walls. This is a whole gallery of paintings of savages who lived once in Tsalka.

However, A. Joakimov did not record this discovery, and information about the site was lost for almost a century. It was only in the 1970s that the Trialeti archaeological expedition, led by M. Gabunia, with the help of the letter mentioned above, was able to rediscover the site. Today, it is commonly known as the Trialeti petroglyphs, also referred to as Tsalka petroglyphs or Patara Khrami petroglyphs (Gabunia and Vekua 1980).

In 1976, Gabunia recorded the area with the highest concentration of engravings, identifying six main panels containing approximately 100 images (Gabunia and Vekua 1980). Subsequent small-scale surveys in the 2010s revealed new panels, expanding the distribution of petroglyphs (Gabunia et al. 2019).

Gabunia proposed two different chronological models in her publications. The initial

monograph (Gabunia and Vekua 1980) outlined four main chronological groups for the Trialeti petroglyphs: 1) Mesolithic-Chalcolithic; 2) Early and Middle Bronze Ages; 3) Bronze-Iron Age; 4) Undated (but probably later). In a recent paper (Gabunia et al. 2019), the author adjusted the approach, recognising only two chronological groups: 1) Mesolithic (9th–7th millennia BCE) and 2) Chalcolithic-Bronze Age (5th–3rd millennia BCE). Gabunia compared the most ancient figures (with no mention of the exact figures) to Anatolian rock art, particularly Adi-Yemen and Palinli Caves, finding similarities with Arabian, Levantine and African Post-Palaeolithic rock art (Anati 1972; Simoneau 1975).

Another field campaign was undertaken in 2019 by the National Agency for Cultural Heritage Preservation of Georgia, during which several new panels were discovered in previously unexplored locations along the Avdriskhevi River gorge. This expanded the distribution of the panels to a length of up to 5 km. Apart from some new engravings, a panel featuring two red-painted figures was found almost 2 km south of Panels 1–6 (Giorgadze and Niniashvili 2020).

Furthermore, Batiashvili et al. (2023) investigated the chemical and mineralogical composition of these paintings. They identified haematite as a main colouring agent, along with different associated minerals.

2.2. Geography and geology

The Trialeti rock art site is located in southern Georgia within the municipality of Tsalka, approximately

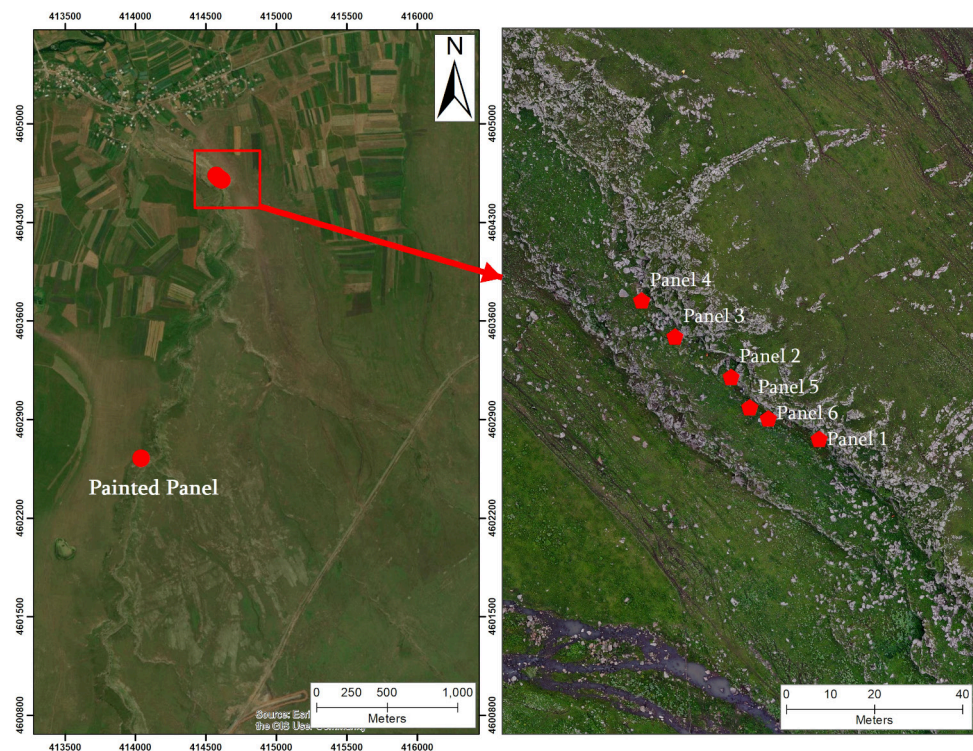


Figure 2. Satellite image (left) and aerial photograph (right) of the Avdriskhevi River gorge with the locations of the main panels and the painted panel (credits: M. Lobjanidze, G. Kirkitadze).

70 km southwest of Tbilisi, the capital of Georgia. It is situated at an altitude of 1595 m in the Avdriskhevi River gorge, a tributary of the Khrami River, 1 km south of the village Gantiadi (formerly Tak-Kilisa) (Fig. 2).

In the broader geographical context, the Tsalka Plateau lies at the northernmost extension of the Lesser Caucasus Uplands, encompassing the vast volcanic plateaus that stretch across Georgia, Armenia and eastern Anatolia. Bounded to the north by the Trialeti Range, the Tsalka Plateau forms the Khrami River, a major tributary of the Kura River. Geologically, the plateau consists of Upper Pliocene and Quaternary lava flows, mainly dolerite and andesite-basalt. In certain areas, these formations are overlain by more recent lacustrine and alluvial deposits (Connor and Sagona 2007).

The reconstruction of the palaeo-landscape, according to pollen records from the region, indicates the mixture of subalpine meadows and scattered mixed mesophytic woodlands between the period of 8000–5500 BCE. Therefore, the landscape was only partially wooded. In other words, this area has yielded evidence of both forest and steppe environments. According to climatic modelling based on paleoenvironmental data, during the Mesolithic, the climate was still quite arid. Later, during the Neolithic, the vegetation was diverse based on geographical characteristics. So, the higher altitudes, like the Tsalka Plateau, consisted of oak-hornbeam forests. After 6000 BCE, the stabilisation of the Black Sea caused increasing atmospheric moisture in the arid environments of the Caucasus, which resulted in the expansion of oak woods (Connor and Sagona 2007).

This region shows a ‘climatic optimum’ during

the following period between 4000 and 2000 BCE. Highlands provided a more stable and favourable environment for agriculture. This period began the afforestation of the arid lands over the territory of Georgia. On the Tsalka Plateau, trees were distributed over the mountain grasslands, yet there is no evidence of dense forest. However, slightly later, during the end of the Bronze Age, the oak savanna extended to at least 1600 m above sea level, the approximate elevation of the Trialeti rock art site. This merged with denser oak-hornbeam forests until about 1500 BCE (Connor and Sagona 2007).

The study area is composed of Late Pleistocene andesite-basalt lava flows, which have produced terraces on both sides of the river gorge (Fig. 3). Near the studied panels, the second, third, and fourth terraces are well-presented, while the first lava flow is minimally exposed at the river level and is mostly submerged beneath the water (Fig. 4).

The Avdriskhevi River gorge traverses the Tsalka Plateau from south to north and joins the Khrami River. Based on the latest data (Giorgadze and Niniashvili 2020), the distribution of rock art panels within the river gorge covers almost 5 km. This 5 km distance represents the deepest and widest part of the gorge, containing several non-karstic caves, rockshelters and mostly simple flat surfaces of andesite-basaltic rock. In contrast, the lower stream of the Avdriskhevi River, a junction of the Khrami River, flows through a vast plain devoid of rocky outcrops. Conversely, the upper stream of the gorge is narrow and lacks rocky outcrops as well. As a result, the rock art panels are concentrated in a specific area. This picture of the microenvironment explains the boundaries of rock art distribution over a certain distance.



Figure 3. Aerial photograph of the Avdriskhevi River gorge showing the terraces and the surrounding area (credit: G. Kirkidatze).

3. The archaeological context of Trialeti and its surroundings

The environs of the Trialeti rock art site boast a rich archaeological heritage, demonstrating human occupation since at least the Mesolithic period. The area comprises the Trialeti Mesolithic Culture, represented by the key sites Edzani and Zurtaleti (Gabunia 1976) and other Mesolithic sites discovered in the 1990s (Sturua 2010). These sites have yielded forest and steppe environments in exclusive proximity to a massive obsidian source in the

region (Connor and Sagona 2007). In their work, Manko and Chkhatarashvili (2022) highlight the most characteristic features of the Trialeti Mesolithic Culture, such as direct and indirect percussion in cores reduction strategy, asymmetric triangles, bitruncated faceted blades with backed edges, asymmetric lunates, bladelets with bipolar abrupt retouch, truncated faceted blades, symmetric triangles and the microburin technique.

While the Neolithic presence is relatively limited in the adjacent area, rockshelters Paravani I and Paravani II are worth mentioning. They are located near Lake Paravani, some 18 km southwest of the Trialeti rock art site. Microlithic and geometric tools identified at these sites were considered Late Mesolithic-Neolithic by scholars (Kikodze and Koridze 1978).

During the Bronze Age, this area was part of the widely distributed Kura-Araxes Culture, spanning from the mid-4th to the mid-3rd millennia BCE

(Shanshashvili 2010). Later, between the late 3rd and the mid-2nd millennia BCE, the highland plateaus witnessed the massive kurgans associated with the Trialeti Middle Bronze Age Culture (Kuftin 1941; Sagona 2017). Among these kurgans, a group of the Zurtaketi Kurgans is particularly interesting, where hundreds of stone slabs with various engraved motifs have been discovered (Japaridze 1969). Some of those

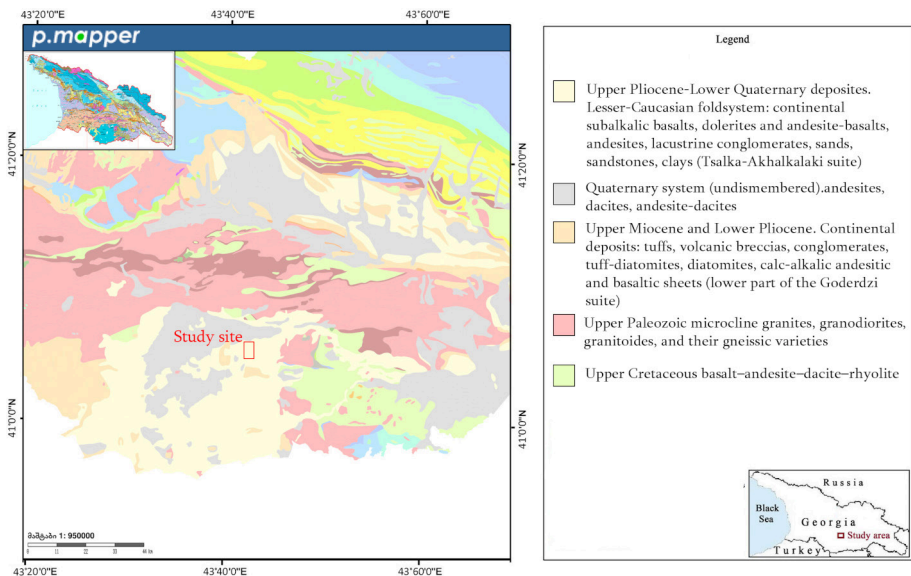


Figure 4. Geological map of the study area (source: www.geoscience.ge).

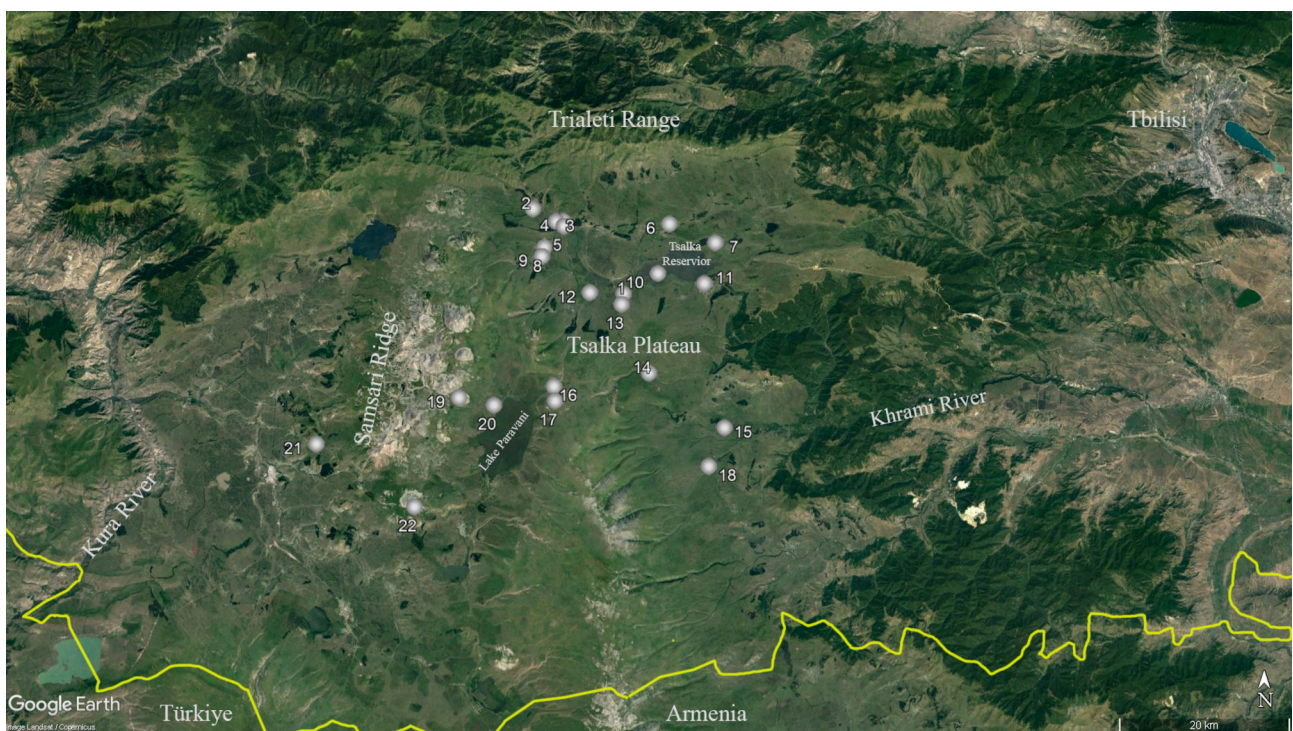


Figure 5. Distribution map of the main archaeological sites in the adjacent area of the petroglyphs. 1. Trialeti petroglyphs; 2. Massive decorated (engraved) stone; 3. Mesolithic site near village Avranlo; 4. Avranlo Kura-Araxes (EBA) settlement; 5. Avranlo Megalithic settlement; 6. Mesolithic site near village Ai-Ilia; 7. Beshtasheni Kura-Araxes settlement; 8. Ozni Kura-Araxes settlement; 9. Ozni Megalithic settlement; 10. Massive decorated (engraved) stone from kurgan; 11. Edzani Mesolithic site; 12. Sakdrioni Megalithic settlement; 13. Tak-Kilisa Megalithic settlement; 14. Chochiani Megalithic settlement; 15. Zurtaketi Mesolithic site; 16. Chikiani Menhir; 17. Chikiani obsidian source; 18. Zurtaketi Kurgans with engraved slabs; 19. Shaori Megalithic settlement; 20. Paravani I and II Neolithic sites; 21. Bavra-Ablari Mesolithic-Chalcolithic site; 22. Abuli Megalithic settlement (source: Google Earth).

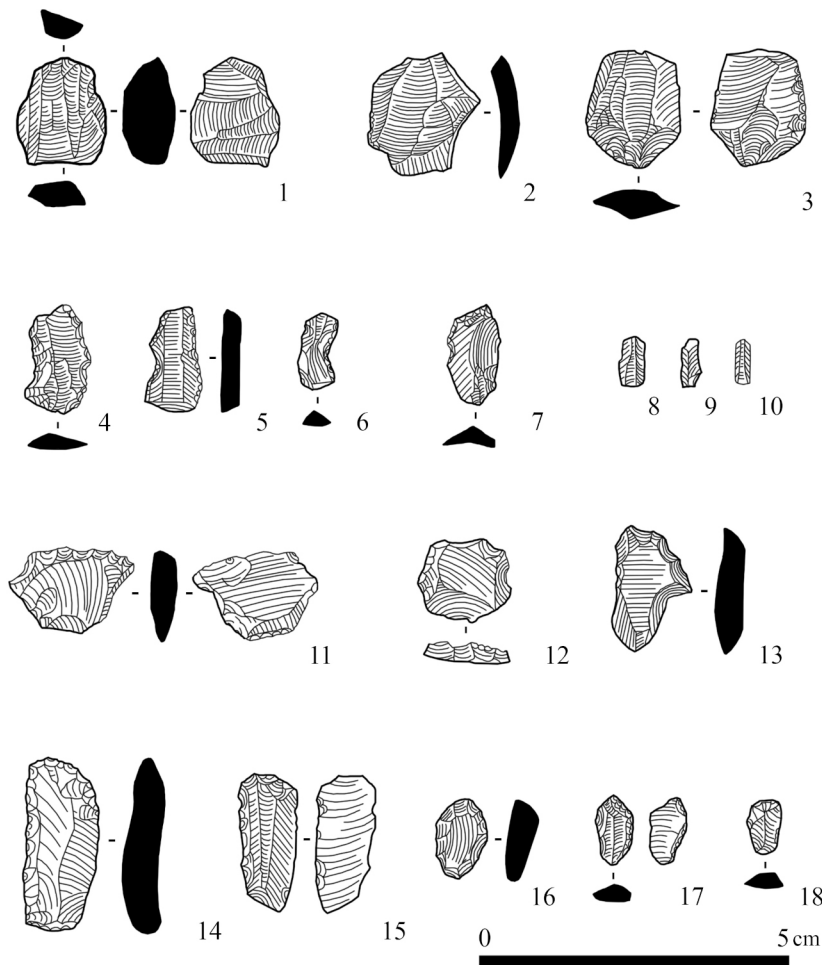


Figure 6. 1–3. Cores; 4–6. Side notched blades; 7. Blade with retouch on the distal end; 8–10. Micro blades; 11–13. Denticulated scrapers; 14–15. Scrapers made on blades; 16–18. Micro scrapers (redrawn after Gabunia and Vekua 1980).

motifs were linked to the Trialeti rock art by Gabunia and Vekua (1980). In addition, the region is renowned for its megalithic structures, especially the Bronze Age fortifications (Narimanishvili 2019) (Fig. 5).

3.1. Archaeology of the Trialeti rock art site

Regarding the study site and its archaeology, the fourth terrace of the Avdriskhevi River gorge comprises several non-karstic caves that formed through the erosion of volcanic breccias. The archaeological materials were observed on the surface outside the caves. Excavations led by Gabunia have confirmed that the materials were transported multiple times (Gabunia and Vekua 1980). Subsequently, the main components of the archaeological findings will be presented below.

3.1.1. Lithic assemblage

The lithic assemblage, consisting of 1376 items, including tools, waste and blanks, is the most extensive found at the site (Gabunia and Vekua 1980). Geographical proximity to the eminent Chikiani source explains the primary use of obsidian as a raw material in stone tool production in Trialeti (Biagi et

al. 2017). Various cores of different periods and shapes are present within the collection, including prismatic, pyramidal, bifacial, unifacial, conical, and single platform.

The blades are denticulated, side-notched and retouched on the distal margins. This group also contains microblades characteristic of the Mesolithic in the region (Gabunia 1976; Varoutsikos et al. 2017).

Scrapers are represented by side scrapers and end scrapers, among which the oval-end scrapers, notched side scrapers, and scrapers with retouch on the distal end are distinguished. Other common tool types in the collection include burin, drill and geometric microliths (Fig. 6).

3.1.2. Faunal assemblage

A total of 218 items of osseous material were discovered; however, the majority are highly fragmented and unidentifiable. Among them, only 37 bones belonging to the following fauna were identified: *Equus* sp., *Bos* sp., *Ovis* sp., *Ochotona* sp. etc.

According to the palaeontologist A. Kevua, faunal remains of the *Equus* genus discovered at Trialeti pertain to *Equus caballus strictipes*, dated to the Pleistocene and Holocene based on studies from adjacent sites (Burchak-Abramovic and Bendukidze 1963; Grigolia and Vekua 1963; Vekua and Lordkipanidze 2011). Gabunia and Vekua (1980) proposed that the engraved equids observed in Trialeti rock art represent the *Equus caballus strictipes* species, which was abundantly found in the osseous materials in Trialeti and was prevalent in the Late Pleistocene-Early and mid-Holocene local fauna.

Another noteworthy inclusion in the Trialeti bone assemblage is *Ochotona* sp., which has been identified across Pleistocene sites in the South Caucasus, namely Urtsk (Dal 1957), Tsopi Cave (Vekua 1967), Azokh Cave (Aliyev 1969).

Furthermore, fossils of the *Bos* genus have also been important species in the local fauna since the Pleistocene (Gabunia and Vekua 1980).

4. Materials and methods

The Trialeti site complex comprises several non-karstic caves, rockshelters and flat rock surfaces. Rock art is only observed on the flat rock surfaces of andesite-basaltic origin. The studied area, where the main panels are recorded, is concentrated within 500 m². However, the area, which includes the locations where new panels were recently discovered (Gior-

gadze and Niniashvili 2020), spans a length of about 5 km, equivalent to 1.1 km².

The authors' most recent fieldwork in 2022 aimed to advance the state of the art of the Trialeti corpus using traditional and digital methods. The primary objectives included clarifying the locations of the panels and addressing the ambiguity of figure references in the original publication (Gabunia and Vekua 1980). To achieve this, the main panels (1–6) and the figures on each were thoroughly searched, identified and recorded in the GPS-based database. They were recorded using written, graphic and photo documentation. For paperwork, the field documentation approach was adapted from Whitley (2011). All the available data was recorded using graphic units (GU).

Digital photography was performed using a DSLR camera, Canon 700D, and engravings were subsequently traced digitally using Adobe Photoshop. Additionally, aerial photography was employed, and the site mapping data were updated in ArcGIS.

Drawing upon observations of past environmental transformations in the study area throughout millennia (Connor and Sagona 2007), different volumes of patination proved invaluable in estimating the relative chronological framework of the petroglyphs (Guagnin 2014; Macholdt et al. 2017; Zerboni 2008). Following the approach where darker figures are considered relatively older than lighter ones (Basafa et al. 2022), we identified four main categories of patina within the studied panels (Fig. 7).

5. Results

5.1. Rock art

Within the recorded area, 103 figures are distributed over six panels. They were recorded and numbered in the same order as Gabunia and Vekua (1980) to avoid further confusion. Panels 1–6 are lo-



Figure 7. Examples of four different patinae: A – dark; B – light dark; C – light; D – no patina (photos: authors).

cated north of the gas pipeline (Fig. 8), on the fourth terrace of the right bank of the Avdriskhevi River. The panels face southwest and represent the vertical and horizontal cliff sections.

Incision is the most frequently used technique at the Trialeti rock art site complex (Zavradashvili et al. 2023). In general, the overview of the South Caucasus

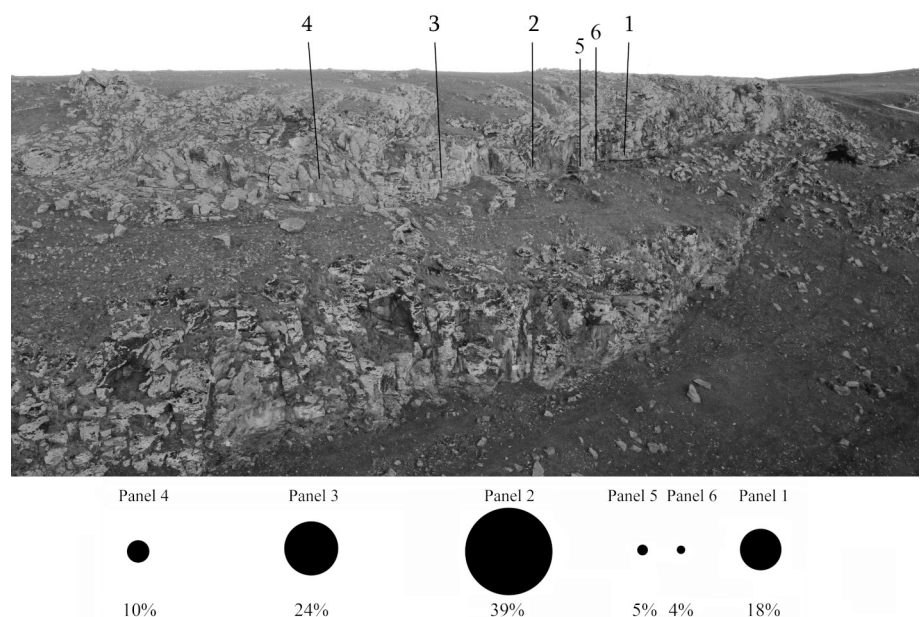


Figure 8. Aerial photograph showing the location of panels 1–6 with the percentage of the recorded figures on each (editing: L. Losaberidze).

rock art sites reveals a variety of techniques such as scratching, carving, abrasion and percussion (Knoll 2016; Knoll and Meller 2015; Sigari et al. 2019; Walking et al. 2015).

The figurative repertoire can be grouped into three main categories: zoomorphic (57 figures), anthropomorphic (6 figures), and geometric (9 figures). Other categories are weapons (bow and arrow) (5 figures), religious signs (cross) (11 figures), abstract (6 figures) and undetermined (9 figures).

Overall, nearly 55% of the motifs are zoomorphic. It is followed by 9% of geometric and 6% of anthropomorphic motifs.

Panels, on average, are 1–2 m long and wide, but some of them reach 5–8 m in length. The figures vary between 2.5 and 20 cm, and the width and depth of incisions are 1–2 mm (Table 2).

Panel	Number of images	Length/Width	m a.s.l.
Panel 1	19	1.5m × 1.1 m	1575
Panel 2	40 (15/25)	1.85m × 1.3 m	1567
Panel 3	25 (19/6)	8.0m × 3.1 m	1565
Panel 4	10	5.1m × 2.0 m	1566
Panel 5	5	2.1m × 0.6 m	1569
Panel 6	4	2.4m × 1.2 m	1571

Table 2. The number of images, measurements and altitude of each panel.

The figures on each panel are displayed in various ways: hunting scene, group of animals (with at least two or three animals), or isolated figures.

6. Discussion

6.1. Zoomorphs

Zoomorphic motifs are often seen as the most

recurrent motifs in rock art (Sigari and Garcês 2021). In Trialeti, nearly ten distinct styles of animal figures have been identified, presumably spanning the long chronology from the early and mid-Holocene to the Historical era. According to Gabunia and Vekua (1980), the recognised animal species include horses, deer, ibexes, camels, foxes, lions, donkeys, bulls, tortoises and snakes. However, our study reconsidered the given data and identified the following animal genera: equids, cervids, caprids, camelids and birds. Statistically, among 57 zoomorphic images, most are cervids (18) and equids (6) from various chronological periods. They are followed by camelids (3), caprids (3), birds (1) and hybrid/unreal animals or undetermined genera (26). Furthermore, concerning the orientation of the zoomorphic figures, 35 are oriented to the left and 20 to the right, while the other two remain unclear.

The following sections will discuss some of the most interesting zoomorphic figures according to the genera.

6.1.1. Equids

Equids are present on Panel 1 and Panel 3A, featuring three figures each. These six figures have four different styles (Fig. 9).

The equid (P1-GU12) is engraved profiled and oriented to the left. The figure has a curved neck and two stylised ears. The posterior limbs are more realistic than the anterior ones. The posterior hip is well-defined, marked by curved lines on both sides. A part of the belly is depicted with a slightly curved line, and its tail is engraved with a straight line (Fig. 9A).

Using available data, we delve into the chronological attribution of the horse image. As indicated before, the faunal record of the Trialeti site complex contains the remains of *Equus caballus strictipes*, dating back to the period from Late Pleistocene to Early and mid-Holocene age (Gabunia and Vekua 1980; Vekua and Lordkipanidze 2011). Secondly, this image demonstrates an obviously darker patina compared to other figures at the site (see Fig. 7A). Thirdly, the tail of the zoomorphic figure (GU10) engraved to its left is superimposed over the face of the horse (GU12). In addition, the stylistic characteristics of this equid image, compared to the rest of the zoomorphic figures in Trialeti rock art, claim the most sophisticated and outstanding manner of making a petroglyph. This can be suggested due to artistic impressions, such as the more realistic representation of body features. Moreover, regional



Figure 9. The equid engravings from different panels: A) P1-GU12; B) P1-GU3; C) P3A-GU16,17,18; D) P1-GU16 (photos: authors).

comparisons, while not very diverse, reveal a subtle similarity between the horse figures from Trialeti (P1-GU12) and Gobustan (Stone No. 45, Ovçular Cave, 470 Büyükdaş Mountain), with the latter attributed to the Neolithic period (Farajova 2011). Hence, based on the given data, we infer a similar age for this particular image from Trialeti.

Regarding the rest of the equid images, another example (P1-GU3) is engraved profiled and oriented to the right. It is depicted in an outline style, meaning the legs are not portrayed in a quadrupedal stance. Also, the figure has a long tail and a mane (Fig. 9B).

The third equid image (P1-GU16) is observed on the extreme right side of Panel 1. While also engraved schematically, its style of execution differs from the other images. It is depicted as a quadruped, profiled and oriented to the right (Fig. 9D). The engraved lines on its body may be interpreted as a saddle and may be dated to the historical period (Olsen 2017).

Another panel featuring equid images is Panel 3A. These grouped equids are engraved in a homogenous manner, likely belonging to a single period. All three equids (P3A-GU 16, 17, 18) are profiled and oriented to the right. They are portrayed in a highly schematic manner and do not exhibit similarities with other equids from Panel 1, nor with any other zoomorphs from the entire site (Fig. 9C).

6.1.2. Cervids

Cervids form the largest group among zoomorphs, comprising 18 figures, with the majority observed on Panel 2B. The remaining cervids are recorded on Panel 1 and Panel 5.

A group of three deer (P1-GU13, 14, 15) is depicted on the upper right-hand side of Panel 1 (Fig. 10C). Some scholars interpret a scene in which the largest deer in the middle is suckling its young, portrayed below its feet (Sagona 2017). However, this interpretation is controversial since the largest deer figure is presumed to be male based on the presence of antlers. These deer images share stylistic similarities with another cluster from the same panel (GU5-8) and some figures (camelids and caprids) from Panel 2A. The portrayal of their bodies, particularly their feet and toes, is analogous.

Another deer figure from Panel 1 (GU18) displays a more distinct style compared to the rest of the figures both from this panel and from other panels. This figure possesses an elongated body shape, drawn outlined

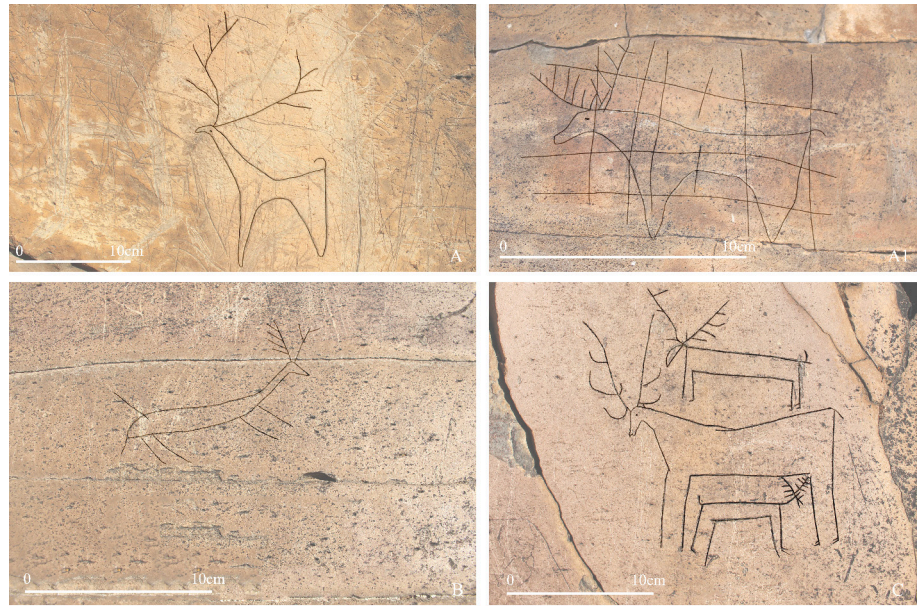


Figure 10. The cervid engravings from different panels: A) P2B-GU11; A1) P5-GU1; P1-GU18; P1-GU13, 14, 15 (photo: authors).

and schematic. However, despite its schematic representation, the figure is in motion and captures more recognizable deer characteristics. The legs are inclined, creating the impression that it is still running, even though the animal is shown wounded with the arrow in its haunch (Fig. 10B).

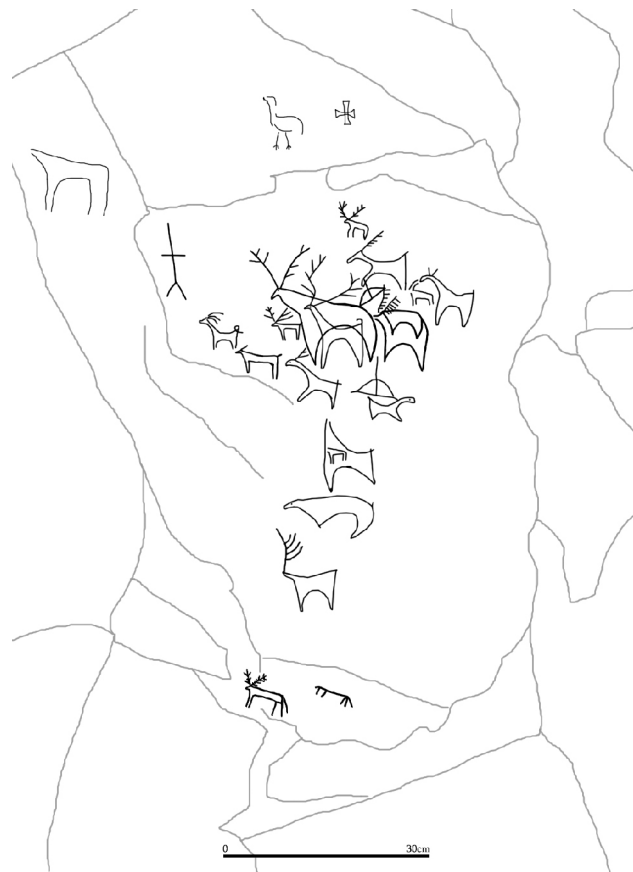


Figure 11. Digital tracing of Panel 2B (tracing: L. Losaberidze).

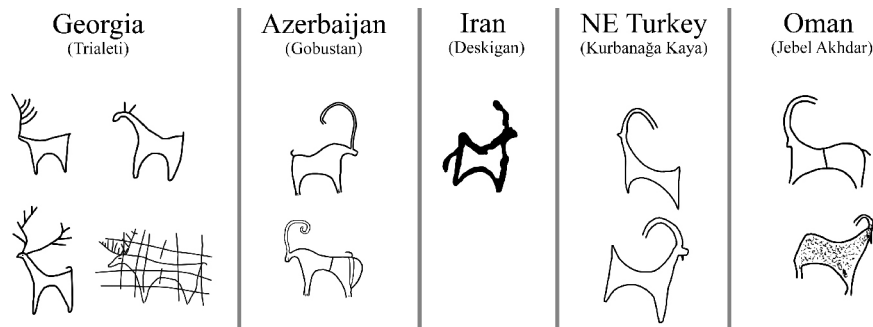


Figure 12. Repeated pattern identified in different areas of the Middle East (editing: L. Losaberidze).

The majority of cervids are depicted on Panel 2B (Fig. 10A; Fig. 11). They comprise 11 figures and represent one of the most characteristic scenes of the Trialeti petroglyphs—hunting for a group of cervids and caprids. Notably, in this scene, each animal faces left, except for a single unidentified zoomorph oriented in the opposite direction, depicted with the bow and arrow above it. This could be interpreted as a wounded animal that can no longer escape and has been left behind by the group. Another image of a bow and arrow is displayed above the haunch of the largest deer engraving on this panel. Despite the absence of a single hunter in this scene, details such as the bow and arrow shown atop the separated animal suggest the hunting scene.

A deer figure with a similar pattern to the previous group was observed on Panel 5 (Fig. 10A1). It represents a trapped animal in a hunter's net (GU1). Seemingly, this figure is stylistically related to most of the figures from Panel 2B. However, the novelty of this figure lies in its portrayal of the hunted with the net engraved over the animal. The net is schematically

rendered, using three to five horizontal and vertical intersecting lines. A similar net-hunting scene is identified at Deskigan, southeast Iran (Shirazi 2016).

Closer observation suggests that most animal figures from Panel 2B, especially cervids and so-called trapped deer from Panel 5, exhibit a repeatable pattern of the lower body, forming a semi-circle shape. The homogeneity of style throughout the entire panel propounds a short chronology for

those figures.

The regional study suggests a wide diffusion of similar patterns throughout the Middle East, encompassing the South Caucasus region. Consequently, the curved shape of the ventral part, which sometimes creates a bilateral design for the animal's body, has been observed in the Early Bronze Age sequence of various sites, including Gobustan, Azerbaijan (Farajova 2018; Jafarzade 1999; Shirinli and Abdullayev 2021), Deskigan, Iran (Shirazi 2016), Kurbanaga Kaya, northeast Turkey (Özgül and Bingöl 2021) and even further like Oman (Fossati 2015) (Fig. 12), where these animals are depicted isolated, grouped, or in 'hunting scenes'.

6.1.3. Caprids

Caprids are encountered three times, with figures appearing on Panels 1, 2A and 2B. Although executed differently, the caprid from Panel 1 (GU6) and the one from Panel 2A (GU6) demonstrate some similarities. However, the caprid from Panel 2A reveals more identifiable features for this genus. The third figure (P2B-GU7) is depicted among a large group of animals in the hunting scene from Panel 2B. Nevertheless, its small size and schematic nature do not provide much detail to discuss.

6.1.4. Camelids

Three camelids (GU 5, 9, 15) are observed on Panel 2A. Two of them, GU5 and GU15, represent the same stylistic group as caprid (GU6) from Panel 2A and several figures from Panel 1, including cervids (GU13, 14, 15) and other zoomorphs (GU5, 6, 7, 8). The third figure, which is interpreted as camelid due to the presence of double humps



Figure 13. Zoomorphic figures (GU5–8) from Panel 1 (photo: authors).

on its body, is in the lowest part of Panel 2A. It is indeed portrayed differently compared to other presumed camelids.

6.1.5. Other figures

Because the schematic style is widely distributed in Trialeti rock art, almost half of the zoomorphic figures could not be identified in animal genera. Zoomorphic figures (GU5-11) from Panel 1 are challenging and difficult to identify. They are portrayed in a highly schematic manner and lack identifiable features. GU9 was previously considered a lion by Gabunia and Vekua (1980), but we disagree since the characteristic features of a lion have not been observed. The other two animals (GU10 and GU11) engraved below GU9 are less clear, but the larger figure has similarities with Gobustan rock art attributed to the Late Bronze Age (Shirinli and Abdullayev 2021).

The cluster of four figures (GU5–8) shows a homogeneous style (Fig. 13). They are most likely produced during a single period. Two of them, GU5 and GU8, have a two hump-shaped detail on their back, yet it remains unclear whether the artist intended to portray a camel, a horse with a saddle, or another subject. These figures share consistent artistic impressions, such as a rectangular body shape, primitive style, quadruped form, and a distinct manner of portraying feet and toes. Once again, these figures show similarities with GU13–15 from Panel 1 and GU2, 6, 15 from Panel 2A.

A single zoomorphic image (GU1) from Panel 3B represents an unidentified animal with less distinct features (Fig. 14). It is drawn quadruped, oriented to the right and appears motionless. The body is hemispheric, featuring two triangle-shaped humps on the back and a long tail. The animal has a curved neck with two simple lines on top, possibly indicating horns or ears.

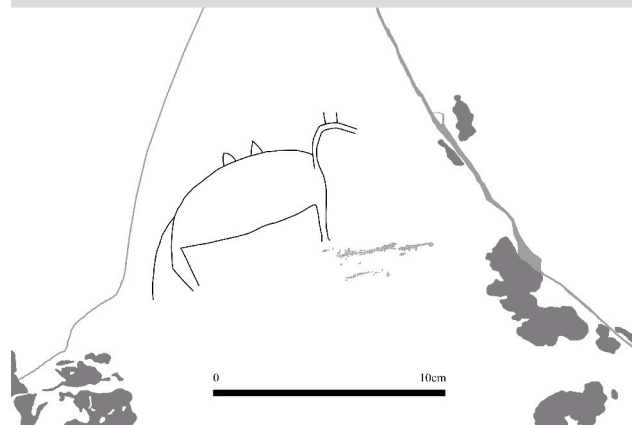
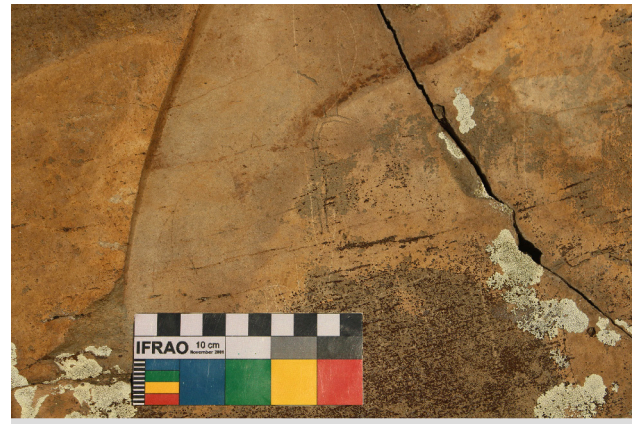


Figure 14. Zoomorphic figure from Panel 3B (photo and digital tracing: authors).

6.2. Anthropomorphs

Anthropomorphous motifs comprise six figures throughout the studied panels. They are depicted frontal and represent two different styles: 1) abstract anthropomorphous figures (3 images) portrayed using two intersecting lines, forming a cruciform shape with additional lines at the ends of the body, signifying

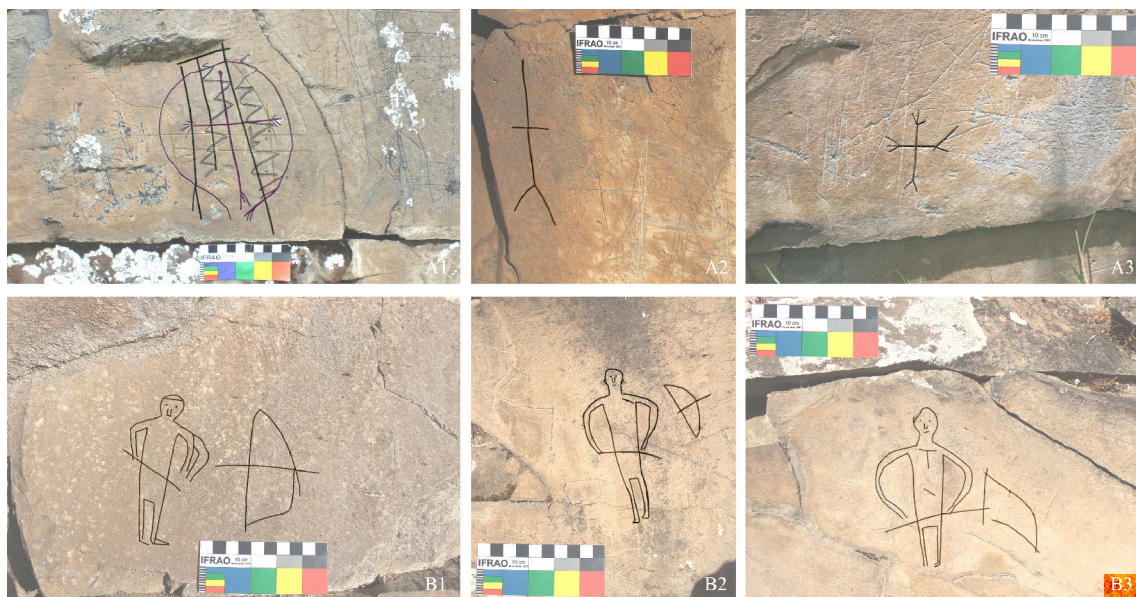


Figure 15. Anthropomorphous figures from different panels: A1) P4-GU4; A2) P2B-GU4; A3) P3A-GU15; B1) P1-GU1; B2) P2A-G10; B3) P2A-GU1 (photo and digital tracing: authors).

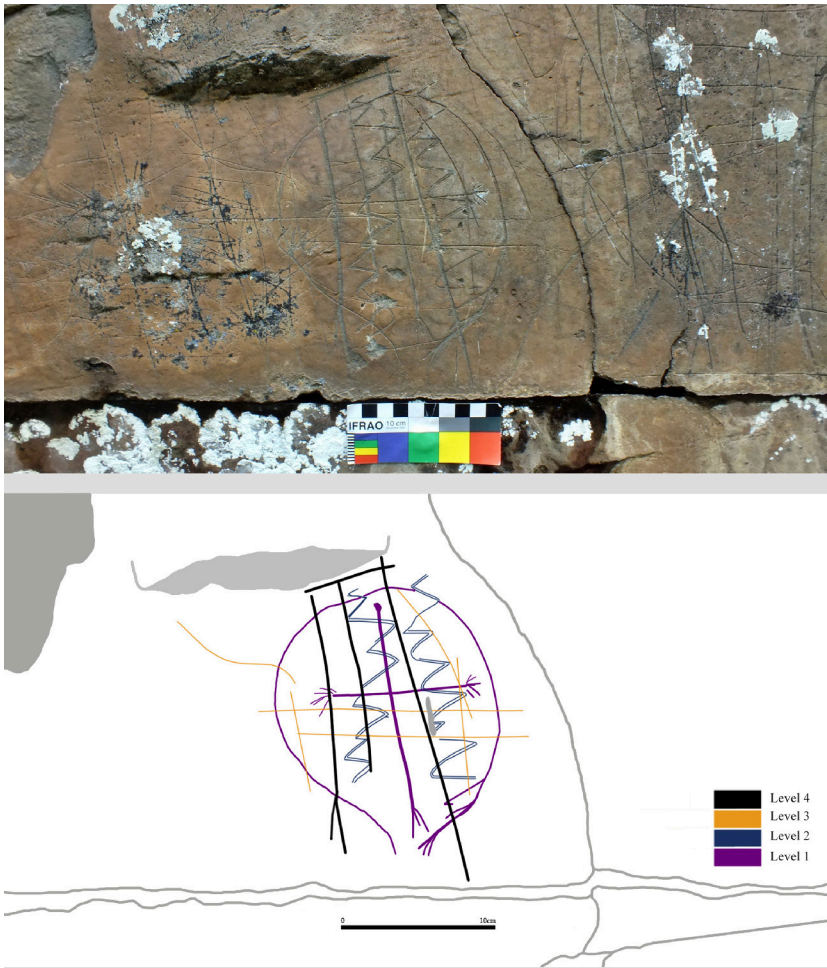


Figure 16. Detailed view of the anthropomorphic figure from Panel 4 (photo and digital tracing: authors).

fingers/toes and hands/feet. In general, they are simple cruciform figures, yet different from each other; 2) outline-schematic figures (three images) belong to a particular style and, therefore, the chronology (Fig. 15). These figures, often referred to as hunters, are consistently depicted clasp one arrow, while another bow and arrow are shown alongside. They are portrayed in the company of animals such as camelids, caprids etc.

6.2.1. Cruciform anthropomorphic figures

The anthropomorphic figure (P4-GU4) is the earliest phase of a superimposed image, featuring at least four layers of engravings. It represents a simple cruciform figure with complex endings, interpreted as fingers. The figure has five and six fingers on the hands. The lower part of the body is depicted with a single line where three twigs represent the toes. The top of the figure has a little head-shaped marking. The figure is observed in superimposition (shown in violet colour). The circle shape surrounding the anthropomorphic figure shows a similar toe shape in the end; it does not overlap the anthropomorph. Therefore, this may belong to the same phase. Two parallel zigzag lines (shown in blue) superimpose the anthropomorphic figure on the vertical line. Several

chaotic, intersecting lines (shown in yellow) cover the zigzag lines and the anthropomorphic figure. The latest phase is a rectangular-shaped figure (shown in black) with the thickest engraved lines (Fig. 16). Overall, the superimposition phenomenon is quite common in Trialeti rock art, and this example is especially noteworthy.

Other cruciform anthropomorphic figures are observed on Panels 2B (GU4) and 3A (GU15). GU15 slightly resembles the anthropomorphic from Panel 4, while the figure from Panel 2B is the simplest form of an anthropomorphic motif among all.

6.2.2. So-called hunters

There are three anthropomorphic figures interpreted as hunters. Even though on both panels (P1 and P2A), where they are located, these anthropomorphs are depicted 'motionless', and there is not a clear picture of a hunting scene, their equipment and the surrounding animals suggest their role as hunters.

A single anthropomorph (GU1) is positioned at the extreme top left-hand side of Panel 1 (Fig. 15B1). It is drawn frontal and static, equipped with an arrow in the right hand, while a set of bow and arrow is depicted

next to its left hand. Below the hunter, more than 15 zoomorphic figures are portrayed. While these depicted animals, from the stylistic point of view, likely represent diverse chronologies, some zoomorphs are suggested to be related to the same phase that of the 'hunter'.

Two anthropomorphs (GU1 and GU10) from Panel 2A (Fig. 15B2, B3) resemble the one on Panel 1. Observing a homogenous style between them and the animal figures portrayed similarly alongside these hunters, as seen in Panel 1, supports the idea that these figures belong to the same period.

6.3. Weapons

Following the discussion on anthropomorphic and zoomorphic motifs, a prevalent attribute accompanying these figures is a specific type of weaponry—the bow and arrow. They are depicted five times across Panels 1 and 2A/2B. Despite the 'motionless' portrayal, all these panels represent 'hunting scenes'. Three images of a bow and arrow are presented alongside their owners, i.e. the 'hunters', while the other two are shown with the group of animals on Panel 2B.

Depicting bows and arrows, especially alongside humans, often interpreted as hunters or archers, is a

worldwide rock art phenomenon and spans a long chronology (Basafa et al. 2022; Jacobson-Tepfer 2015; Jacobson-Tepfer 2019; López-Montalvo 2018; Ranta et al. 2020; Remacle et al. 2006; Vanwezer et al. 2021).

6.4. Geometric figures

Geometric figures consist of nine images representing squares, nets, circles etc. They are primarily distributed over Panel 3 and Panel 4, often covered by lichens. These two panels share homogeneity in terms of motifs but are simultaneously different from the others. Panels 3 and 4 include fewer zoomorphic and anthropomorphic motifs compared to Panels 1 and 2.

Among the geometric motifs, the square figure (GU8) is among the most interesting. It consists of three rectangles inserted one into another, connected by diagonal lines directed from the corners. According to Jafarzade (1999), a similar symbol from Gobustan (Böyükdaş, upper terrace, rock 23) might be interpreted as a talisman or a board game type common in the medieval period (Fig. 17).

6.5. Religious signs

This group is primarily presented on Panel 3A. The upper part of this horizontal panel comprises nine images (in addition to a single cross on the lower part) of a specific type of cross known as Bolnisi (similar to the well-known Maltese cross) (Fig. 18). It has been present and widespread in Georgia since the early Middle Ages (Gamkrelidze et al. 2013).

The cross figures from Panel 3A vary in size and are often incompletely preserved. Some of them have been superimposed by recent interventions, and lichens largely cover them.

6.6. Chronology

Multiple methods exist for estimating the antiquity of rock art, some of which are widely overused and misused, while others are considered valid and reliable (Bednarik 2002).

The challenge in Trialeti, as in other rock art

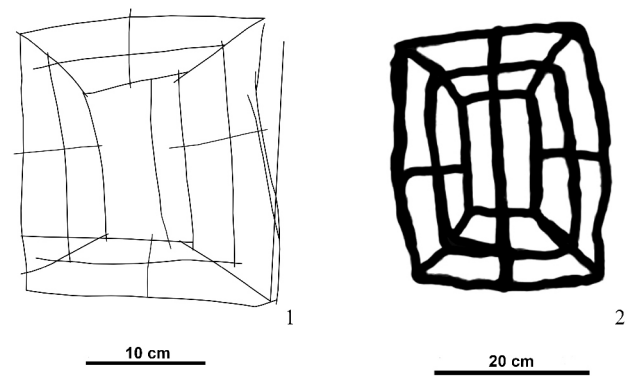


Figure 17. 1) Square figure from Trialeti; 2) Square figure from Gobustan (editing: L. Losaberidze; redrawn after Jafarzade 1999).

sites worldwide, lies in establishing a chronological sequence for the engravings in an open-air context. Especially considering the preliminary nature of the given results, providing a detailed chronology is inadvisable. Therefore, the brief chronological framework can be proposed based on two main methods used in the study: rock varnish-based relative chronology and thematic and stylistic comparisons within the region.

As formulated by some scholars (Dorn 2009; Schneider and Bierman 1997), rock varnish forms on exposed rock surfaces over time, particularly in arid and semi-arid regions. Since the study area has witnessed an arid environment from the Early Holocene (see Chapter 2.2), patination is often observed. However, due to the common use of the incision technique for the engravings, the lines are often relatively thin, making the patina inside them not always visible. In these conditions, it can be stated that these engravings show a wide range of patina, including dark, light dark, light and no patina. Hence, this gradation suggests a long chronology of the site during the Postglacial era.

Exploring the themes and styles of the studied petroglyphs reveals the diversity and complexity

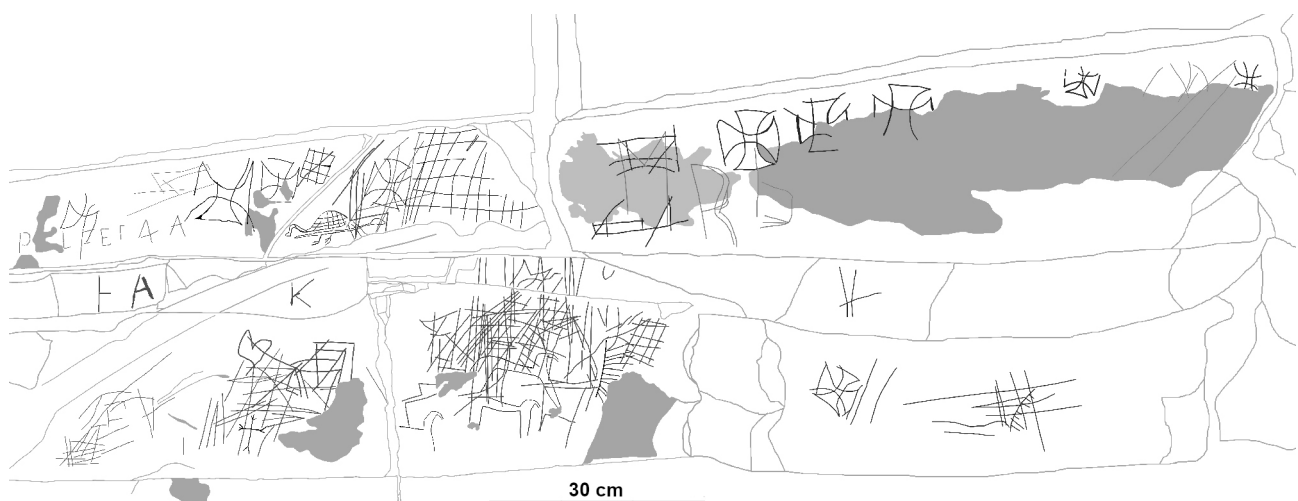


Figure 18. Crosses from Panel 3A (digital tracing: L. Losaberidze).

of the rock imagery. Although styles have changed throughout the millennia, the site's use remained constant until the most recent times.

As a result, several aspects were considered for chronological interpretation. On the one hand, previous works by Gabunia and other authors proposed several chronological phases in Trialeti rock art, spanning from the Mesolithic to the Iron Age (Gabunia et al. 2019; Gabunia and Vekua 1980). However, verifying the accuracy of this proposal was vital. Therefore, more recent and comprehensive data from the region was analysed.

Despite the limited number of rock art sites in the South Caucasus, especially those with a clear chronology and extensive stylistic similarities, a comparative study of figures from a regional perspective indicates several chronological phases in Trialeti.

First, stylistic parallels of the equid (P1-GU12) with the horses from Gobustan (Stone No. 45, Ovçular Cave, 470 Büyükdaş Mountain) (Farajova 2011) suggest the Neolithic as the earliest phase in Trialeti rock art. Moreover, the faunal record from Trialeti has revealed the remains of *Equus caballus strictipes* dated to the Late Pleistocene-Early Holocene (Gabunia and Vekua 1980; Vekua 1967; Vekua and Lordkipanidze 2011), which supports the proposed chronology.

Similarities among the figures in the following phase are even more evident. The repetitive pattern observed in the figures from Panel 2 and Panel 5 has been identified in various locations in the Southern Caucasus and the Middle East (see Chapter 6.1.2), suggesting a possible dating to the Early Bronze Age. However, similar patterns do not necessarily belong to the same period and may have been created at different times (Bednarik 2002).

Stylistic parallels have also been found with the Late Bronze Age rock art from Gobustan (Shirinli and Abdullayev 2021). However, more evidence is needed to establish a stronger connection between the stylistic regions within the Caucasus.

Last but not least is the Medieval Age. Based on the evidence of the crosses on Panel 3A, which belong to a certain type of Christian cross widely known in Medieval Georgia, it is briefly dated to the Middle Ages without more specification. Another important clue in the medieval phase in Trialeti is the square figure (P4-GU8), which has a very similar parallel in Gobustan, attributed to the Middle Ages (Jafarzade 1999).

Finally, the provided data is based on the relative chronology built by various studies in the region. The given chronological phases are interpretative and might be subject to change over time.

7. Conclusions

This study has demonstrated the diversity and complexity of rock art in Trialeti, providing comprehensive data on various details related to the site. Its significance is evident in the enduring use of this place despite environmental changes over millennia. The

striking location of the site has consistently attracted humans since the early and mid-Holocene.

Trialeti plays a crucial role in understanding the local environment, fauna and geological processes, such as rock varnish deposition. On the other hand, the constant practice of rock art with changing styles and themes throughout the pre-Historic and Historical periods is noteworthy. Moreover, analysing the thematic repertoire, it becomes evident that depicting animals, often in the 'hunting scenes', has been the most common trend at this site. Hence, hunting appears to be one of the main interests, if not the main activity, of pre-Historic societies in Trialeti.

In this regard, comparisons with other sites in the region have identified some similarities, primarily with Gobustan rock art. Besides, slightly similar features were found in eastern Anatolia, Iran etc. This suggests stylistic parallels between the regions over the millennia, albeit less studied.

To conclude, the Trialeti site complex highlights the richness of rock art tradition in the South Caucasus and raises numerous issues for further research. The preliminary study has shown that the presented collection is only a small part of the entire site, necessitating complete and more advanced documentation of the panels and figures. Moreover, the site invites the study of the patination, weathering and lichens to develop a more precise chronology in the future.

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