Vol. 06, No. 2, pp.146-168| JUNE 2026
DOI: https:// DOI 10.34118/jskp.v6i2.4625

**Article history** (leave this part):
Submission date: 21.12-2024
Acceptance date: 16-05-2026
Available online: 10-06-2026
**Keywords** **Gestion des compétences ; GPEC ; transformation organisationnelle ; GRH stratégique ; apprentissage organisationnel ; durabilité**
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.
Competing interest:
The author(s) have declared that no **competing interests** exist.
**Cite as (leave this part):**
Hanan Abufares Elkhimry; . (2024). Title. Journal of Science and Knowledge Horizons: 4(1), 283-293. https://doi.org/10.34118/jskp.v2i02.2727

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*Journal of Science and Knowledge Horizons*
*ISSN 2800-1273-EISSN 2830-8379*

# Margouma, A new Rock Art station discovered in the east of the Algerian Saharan Atlas

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## Abstract:

This article presents a descriptive analysis of the newly discovered rock art site of Margouma. The study is grounded in the technical and stylistic examination of the iconographic repertoire, encompassing both engravings and paintings, which depict diverse scenes of prehistoric human activity. By elucidating the thematic nature of the representations on the rock face and the techniques employed in their execution, this research aims to contextualize the site within its appropriate cultural and chronological framework, thereby contributing to the reconstruction of prehistoric settlement patterns in the region.

***Badreddine Selahdja**

## Introduction

Rock art, a distinct physical witness to a prehistoric period that Algeria passed through, was used by humans to express their social activities and lifestyle of that time, presenting them through carvings and drawings displayed on rock surfaces, using various methods and special techniques.

This artistic variety thrived during the Neolithic, spreading all over the country, especially in the Sahara region and the Saharan Atlas. This artistic phenomenon passed through several evolutionary phases since the Holocene, which has been closely examined by researchers while taking into consideration the scenes depicted in various sites alongside their absolute dating.

The Saharan Atlas is considered to be one of the regions with a large number of rock art stations, containing around 390 sites with 622 stations (Hachid. M 1992). Discoveries are still continuing in the areas with rugged terrain east of the Saharan Atlas, where we discovered a new rock art station named Margouma in 2020 amidst our research on the prehistoric and protohistoric settlement in the Ziban region (Biskra-Ouled Djellal), which was indicated to us by members of a local association concerned with hiking. This new station was not included in the sources concerning the subject.

Margouma station is distinguished by the fact that it includes drawings alongside engravings, and it is worth noting that it has a good state of conservation, which aids the technical and artistic study of its contents. Among the representations, we observe human figures, zoomorphic and cryptic depictions in different scenes. Rock drawings are superimposed on the facade of the station, where it is noted that two different colors were used: light red and dark red. These drawings also overlap with the engravings concentrated in the lower part of the left side of the facade.

This superposition provides us with the scientific material that addresses the main research problematic of this study, which is the attempt to understand the methods and periods of re-use of this interface by humans. This is particularly significant since the representations overlap in some places on the façade, indicating that the station was exploited during different periods. If studied closely, it can help us understand the lifestyle of these early artists and the species of fauna that lived in the area, thus contributing to forming a clear idea about the environment and climate that prevailed in this geographical space during that time.

In order to address the issues raised above, we relied upon methods for studying rock art from the technical and archaeological perspectives, which are utilized in field and analytical studies. This approach helped us shed light on this new station (Margouma) in a way that allows researchers to identify it and study it in depth later.

## 1- History of Rock Art researches in the Saharan Atlas

The Rock art in the Algerian Saharan Atlas witnessed much research going back to the XX century, which focused more on the discovery of new stations to enrich the map of the distribution of such phenomenon, adding this to coming up with an intense methodology of study (Flamand.G.B.M 1914) (Lhote. H 1970) (Hachid. M 1982-1983).

The early discoveries in the Algerian Saharan Atlas where by Doctor Jacquot and Captain Koch in 1847 in the site of Tiout and Tiout Tahtani cave in the Southern Oran (Lhote.H et Lihoreau.M 1968). In1862, Pomel recognized the station of Oued Nourène in the Aflou area, followed by the discovery of the site of (Safiet el-Mektouba) recorded by Amead (Aumassip.G 1986).

In 1897 Flamand discovered the site of Bou Alem in El-Bayadh, and then in 1901 he fined a further eight more sites in the area of Aïn Sefra and in the same year Joly discovered the sites of El-Hamrain Oued El-Ghicha and Theniet el-Kherouba (Cominardi.F 1979). In 1899, Blanchet discovered the rock carvings station of Chaâbet Naima on a cliff adjacent to Oued Itel in the southwest of Biskra (Blanchet. M 1899) (Gsell. St 1901) (Lhote. H 1984).

Magny put to light the station of Dekaouin in 1907 in the area of Zaccar, after that the Flamand discovered the site of Daïet esstel in 1914 (Hachid 1981-1982), then in 1921, he presenting an inventory of the discovered stations and an analytical study still adopted by researchers to this day, from an informational or methodological point of view (Flamand. G.B.M 1921).

Research in the Saharan Atlas continued including those of Frobenius and Ober-maier in 1925, who reviewed research conducted by Flamand and criticized his archaeological survey of investigations in 1935 covering the area from Fakik to Aflou (Frobenius et Obermaier.H 1925), In the same year and area, researcher Vaufrey made some investigations on unknown Rock art sites, from which it was concluded the reviewal of the concepts related to the studied sites (Vaufrey. R 1939).

Between 1964 and 1969 the sites of Oued el-Hasbaïa and Ain Naga were rediscovered by Devya Rett and Blanchard (Huard et L 1976). Lhote added several new rock carving sites in the south-western area and suggested a chronological typology by dividing rock art in to several phases (Lhote. H 1970).

It is worth mentioning what critics Muzzolini put forward concerning concepts of rock art especially the ones related to the chronology (Muzzolini. A 1988-1989), adding this to the work of Hachid which presented an inventory on some rock stations in The Mounts of Amour and The Mounts of Ksour, while showing the typology that Lhote used (Hachid. M 1992). In 2001, archaeologist Amara researches in the south-western Saharan Atlas where he count many engravings and drawings of an

estimated number of 4690 including 1643 of which being part of the late phase, attributed to phases of various cultures and forms, and is distinguished by its dimensions and a schematic-geometric style making it hard to discern (Amara. I 2003).

In 2004, the association of Garne Arife, carried an inventory and counting of the rock art sites of the northern part in Laghouat province, in which they discovered the sites of Fidjat al-Sbaa, Kafar-Rmal, al-Farcha and Bouzertala (Hamdi 2018).

## 2- Geographical and Geological framework of the site

Margouma station is located at the coordinates 5°37’39.00”E 35°14’15.00” N in an isolated location away from any urban settlements, situated north of El Kantara municipality, specifically on Mount Metlili, which has an elevation of 1496m.

The site was found near a cave that was used by revolutionaries during the Algerian Revolution on that mountain. The location of the site is on the left side of the national road linking the two provinces of Biskra and Batna. It is accessed by heading west towards Mount Metlili, and it can be reached after crossing two heights of mountain ridges south of Mount Metlili, as it is about 18 km away from the national road.

This area is characterized by rugged mountainous terrain which is part of the Saharan Atlas Mountains. It is composed of formations dating back to the Palaeogene, represented by layers of limestone and dolomite associated with layers of marl and clay dating back to the Lower Cretaceous, followed by formations from the Middle Cretaceous which extend over large areas and are mostly characterized by limestone levels and marl junctions. **(Fig. 1)**.

## 3- Description of the station

Discovered by hikers, the station was mentioned for the first time in our research on the protohistoric period in the Zab area in 2020. After research and investigation, it turned out that it was not mentioned in any studies conducted by previous researchers, due to its location in an isolated area amidst mountainous terrain (Selahdja 2020). It is known as the station of Margouma, which is a local denomination describing things containing a dotted shape, and it was known only among the few shepherds who frequent this area.

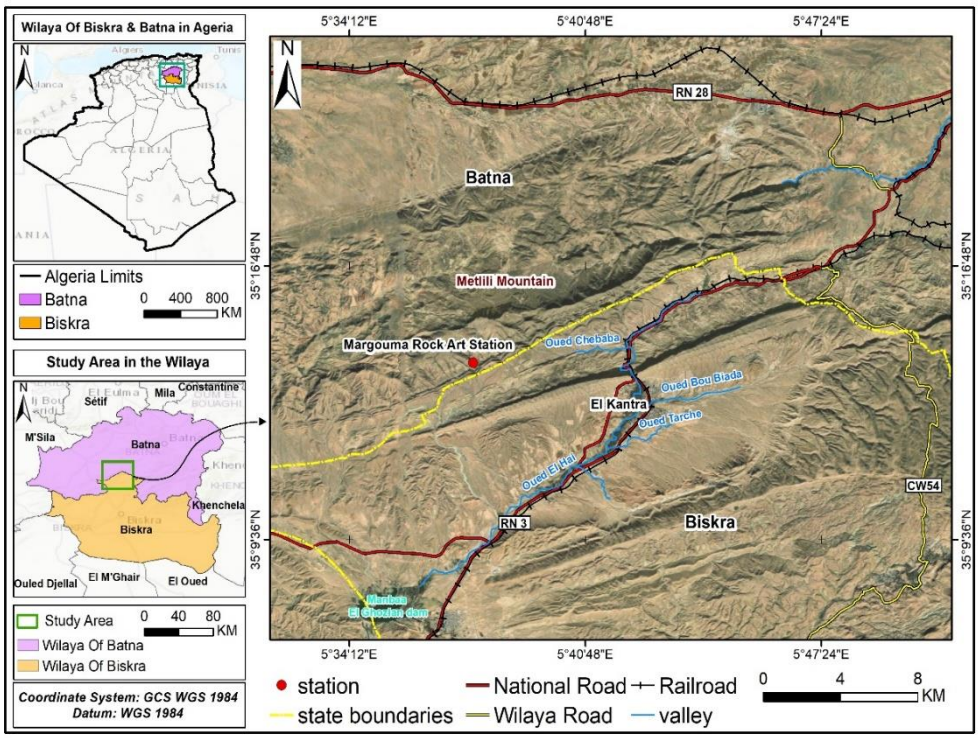



**Fig. 1.** Topographic map showing the location of Margouma Station. Created using ArcGIS software.

Margouma station is a rocky concavity situated within a hollow massif on one of the peaks of Mount Metlili, which is composed of limestone. It features a horizontal façade of medium mass, measuring 3.08 meters in length, with a maximum height reaching 2.54 meters (Fig. 2).

This interface faces southeast and is distinguished by its hollow form, extending into the interior with a depth reaching 0.4m at the southern corner. We observed that the surface of the interface is partially utilized, as there is a variety of drawings and carvings on its upper section. These are concentrated mainly on the left side, particularly regarding the engravings, whereas the right side contains fewer drawings. In total, the site comprises no fewer than 105 forms: 76 are drawings, with the remaining 29 being engravings.

Margouma Station exhibits a moderate state of conservation. Although its location in rugged terrain has spared it from human factors of damage, it has not escaped natural factors that have affected its artistic content. This has resulted in surface detachment, the spread of patina and lichens, and cracks.

We also observed corrosion and detachment, resulting from the station's southeastern orientation, which exposes it to the sun and wind, as well as friction and contact with dust particles. This leads to the detachment of parts of the surface

containing drawings and carvings, particularly in the northeastern and central sections.

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**Fig. 2.** General view of the facade of Margouma Station.

The thermal factor is one of the causes of such detachments, resulting from long cycles of summers and winters, as well as days and nights, which impact the granular composition of the rocks. Regarding hydraulic factors, the interface's partial exposure to torrential waters flowing vertically from the top has led to the patination of the surface, thereby obscuring some drawings. The patina has spread across parts of this artistic surface, varying between dark tan and deep dark hues. Furthermore, rain has facilitated the growth of lichens spreading across the western parts of the surface, alongside cracks and fractures in various sections.

## 4- Methodology of study

Early studies on the rock art of the Saharan Atlas relied on differentiating criteria with the goal of classifying various forms and identifying their representation techniques on rock surfaces within distinct periodic stages. However, few of these approaches took into account the geographical, spatial, and environmental contexts in which these cultural events occurred (Flamand.G.B.M 1914) (Lhote. H 1970) (Hachid. M 1982-1983).

Researchers have proposed a typology concerning Saharan Atlas rock art to facilitate its study and the recognition of its different aspects and features. This is

achieved through phases that are differentiated based on techniques, styles, forms, and even subjects. The typologies of both Lhote (Lhote. H 1970) and Hachid (Hachid. M 1982-1983) are the most widely used within the scientific community.

Based on these two typologies, we will study the Margouma Station from technical and artistic aspects, as the methodology of rock art study is based on two elements: the method of rendering artistic scenes on the rock surface, known as the technical study, achieved by identifying the forms depicted in the scenes and the techniques used in their execution. As for the second element, it consists of the subject presented the artistic study of the scene which aims to present the subjects and scenes depicted by the station alongside the styles used.

### 4.1. Formes

Based on past studies of different stations of the Saharan Atlas rock art and through the typologies of researchers, we know that the humans who lived in this geographical space has intended the embodiment of different forms that are classified as follow:

#### *4.1.1 Zoomorphic forms:*

Such as bovines and elephants, which are the most depicted in the rock art of the Saharan Atlas region, particularly the buffalo during the Naturalistic period (Aumassip 2004, 276). This is the same stage to which the sheep with the disc belongs, as this specific depiction is linked to Pharaonic beliefs and the Atlas art of the Neolithic; however, there is a possibility that this one is even older than its counterpart in Ancient Egypt (Lhote. H 1970, 164). As for birds, they are the least represented animals among Saharan Atlas subjects, mostly relating to species such as the ostrich, in addition to the Chlamydotis bird and the flamingo in lesser percentages (Lhote. H 1970, 84), alongside rhinoceroses, gazelles, and felines in the form of tigers and lions (Lhote. H 1984, 226).

#### *4.1.2 Anthropomorphic forms:*

Found mostly in the semi-naturalistic stage, in various forms ranging from squatting positions to triangular-headed characters (Lhote. H 1970, 173-174).

#### *4.1.3 Weapons and Items:*

Usually found in natural scenes, either held by humans or accompanying them, and consisting mostly of spears, bows and arrows, and axes, which are considered more as defensive weapons rather than hunting weapons (Cominardi.F 1979, 98).

*4.1.4 Symbols:*

They are composed of different forms, such as punctuation, and vertical and horizontal lines that follow human and animal depictions (Hachid. M 1992, 109).

## 4.2. Techniques

Regarding the techniques used, scientists agree on the existence of three techniques employed to depict the artistic content in the Saharan Atlas:

*4.2.1 Polishing Technique:*

Most scientists agree that artists used the polishing technique in many cases, but they did not agree on the different phases they went through to perfect it. Some suggested that they used smooth-faced pebbles to polish the surface, as we notice the presence of the polishing technique in many of the interfaces studied, whether through the lines formed by it or by its usage to prepare and treat the endoperigraphic surface (the interior surface of the form) or the exoperigraphic surface (exterior surface of the form) (Hachid. M 1992). The polished line has a U shape, which has a concave form similar to a half-circle, or a V shape that looks like a triangle, which is obtained by using sharp tools (Lefebvre. G 1970, 295-297).

*4.2.2 Punctuation Technique:*

Two techniques are used: direct or indirect pounding. In the first, the pounding is direct, resulting in marks in the form of separated points. As for indirect pounding, it is conducted by placing the perforator on the rock and pounding it using another pebble, resulting in the creation of a mark in the form of close, linear points (Hachid. M 1992, 62).

*4.2.3 Slitting Technique:*

This is conducted using a cutting tool in a repetitive back-and-forth motion on the primary line to obtain a deep line. This technique is used in the Tazina Style (Hachid. M 1992, 64).

It is not possible to study rock art without addressing its artistic aspect, which provides insight into the daily life and activities of humans of that time; this is

achieved by studying the subjects and styles used to depict them. In terms of subjects, it is considered that scenes of hunting, domestication, or even agriculture are the most frequently depicted, whether through drawing or carving. Scenes such as herds of sheep and cattle herded by humans have been found in many stations of the Saharan Atlas, pointing to early domestication. In other scenes, we can also find figures equipped with weapons such as axes and spears, serving as evidence of hunting (Lhote, Camps et Souville 1989, 10-11).

Regarding the styles used to represent different activities on rock surfaces, it must be noted that they vary from region to region. According to the general typologies of rock art, and specifically that of the Saharan Atlas, we can distinguish several styles:

The Naturalistic style, which is considered the most prevalent style in the Saharan Atlas, is known for depicting animals in their real-life dimensions as found in nature (Khaled. F.Z 2020, 7) and focuses on showing anatomical details (Flamand. G.B.M 1921, 12).

Another style is the semi-naturalistic, which extends from the Ouled Naïl Mountains to the Ksour Mountains. In this style, carvings and drawings are depicted with fewer anatomical details than those of the Naturalistic style, with a lesser deformation of the form. In addition, there is the Tazina style, which is considered a Naturalistic style with minimal dimensions. It is executed using a deep, wide, polished line and is distinguished by its precise regularity and elongated extremities such as legs, necks, tails, and horns (Hachid. M 1992) (Lhote. H 1970).

As for the Schematic style, it is distinguished by its lack of anatomical details, as it is limited to presenting only the general features of the body. This is also the case for the semi-schematic style, known for shape modifications that are not present in the original subject, thus making it barely recognizable (Lhote. H 1970).

We proceeded to the station to conduct a field study that depends mainly on taking measurements of the facade and the figures it contains, in order to develop an archaeological recording plan (Fig. 03), and record all information related to its shape, nature, and preservation status.

To facilitate the technical study of the representations on the rocky station, symbols were placed for all the representations of drawings and engraving in the form of laconics for the names and numbers of these figures Where encryption came as follows: DA: Animals Drawings. DP: Humans Drawings. DT: Tools Drawings. DS: Symbol Drawings. CA: Animals Engravings. CH: Humans Engravings. CT: Tools Engravings. CS: Symbol Engravings.

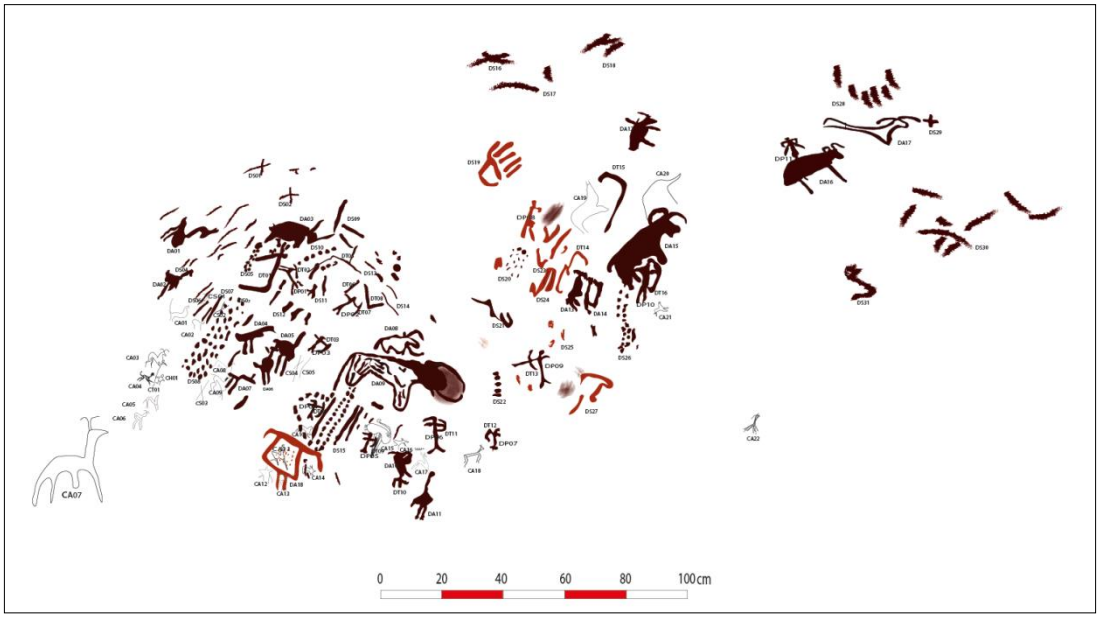



**Fig. 3.** Archaeological elevation drawing of the facade. Digitized using Adobe Illustrator.

### 4.3. study of superposition of figures

To study the superposition of figures, it was necessary to use image processing programs, after photographic documentation of the interface was completed during the fieldwork. Photoshop and DStretch were among the most important programs used, as this processing enabled us to identify the locations where drawn and engraved figures overlap.

## 5- Technical Study of the Station

The study of the station permitted the identification of various presented forms, alongside the clarification of the styles and techniques used.

### 5.1. Study of drawings

We can classify the drawings of Margouma Station into four types (Table 1). Zoomorphic forms constitute a significant presence at the station, with approximately 18 forms. They include two main categories: bovines, represented by buffaloes and mouflons, and birds, represented by ostriches. Regarding anthropomorphic forms, they are less represented compared to Zoomorphic forms, although we identified 11 figures of medium dimensions. Weapons and tools are also distributed across the façade in four types, reaching a total of 16 shapes represented by bows, axes, plows, and sticks. Symbolic representations are the most numerous among the drawings of Margouma Station, with 31 forms represented by points, lines, U-shaped symbols, and X-shaped symbols. Additionally, plus-shaped symbols and hand symbols were found in smaller numbers.

### 5.2. Study of Engravings

The rock engravings of the station are rare compared to drawings, as we count only 29 carvings that were studied in terms of technique and style (Table 2). Carvings related to Zoomorphic forms are the most prevalent on this rock surface, and we notice that their species differ from those of the drawings, which were mostly comprised of buffaloes. We count 22 Zoomorphic forms carved using the polishing technique, represented in 6 types: gazelles, canines, hogs, ostriches, equines, and unidentified animals.

Anthropomorphic forms are extremely rare, as we only found one form of a man holding a spear. Weapons and tools are represented by a hunting tool, specifically a spear. We also identified 5 symbolic forms, 3 of which have an X shape, alongside some lines and an arrow.

## 6- Artistic Study of the Station

The scenes and subjects of stone engravings and drawings vary, and their manifestations are divided between Scenes of hunting, domestication and herding and scenes of religion and daily life.

## 7- Scenes of Hunting in the station

Comprised of scenes of hunters (humans) and prey (animals), with weapons directed toward them and which are mostly spears and arrows, alongside the representation of shields, and it is possible that the purpose of showing them is to glorify famous hunters.

Margouma station is comprised of 8 scenes of hunting, 7 of which are drawings and one that is stone engraving, and they are mostly represented with semi-schematics and schematic styles:

**Table 1:** Technical Study of the drawings

| Identification | Type | Codes | Item | Style | Colors | Coloring | Spread | Direction |
|---|---|---|---|---|---|---|---|---|
| Zoomorphic | Bovins | DA03,10,12,13 | Buffaloes | Semi-naturalistic | Dark red | Full | Up-Low/ left+ Up-right | All-right/10,12,13 to the top |
| | | DA08,09 | | Tazina | | Borders | | |
| | | DA15,16 | Mouflans | Semi-naturalistic | | Relatively | | |
| | | DA17 | | | | Borders | | |
| | Birds | DA01,02,04,05 | Ostriches | Semi-naturalistic | Dark red | Full | Left | all-right/ DA01 Dawn |
| | | 06,07,18 | | | Red | | | |
| | | DA11 | Appears-Ostrich | | Dark red | Relatively | | |
| | | DA14 | Non-identified | | | | | |
| Anthropomorfic | without anatomical charecteristics expressing gender | DP04,05,06,07,08,09 | humain | Tazina | Dark red | Full | Left/ Center | 4 Directions |
| | | DP01,02,03,10 | | | | | | Right side |
| | | DP11 | | Semi-naturalistic | | | | Wearing |
| TOOLS | Weapons | DT02,03,04 | Bows | Semi-naturalistic | Dark red | Full | Left | 4 Directions |
| | | DT07,09, 13 | | | | | Right | |
| | | DT11,12 | | | | | | |
| | | DT05,08 | Axes | Semi-naturalistic | Red | Full | Up-left | / |
| | | DT14,15,16 | | | Darkred | | Up-Right | |
| | | DT01 | Plows | Semi-naturalistic | Darkred | Full | Left | / |
| | | DT10 | | | | | Right | |
| | Sticks | DT06 | Batons | Semi-naturalistic | Darkred | Full | Up-Right | / |

**Table 1** (Part 2)

| Identification | Type | Codes | Item | Style | Colors | Coloring | Spread | Direction |
|---|---|---|---|---|---|---|---|---|
| Symbolic Forms | Points | DS05,08, 10,13,20 | Linearform | Schematic | Dark red | Full | Left-Center | / |
| | | 22,26 | | | | | | |
| | | DS15 | Bow form | | | | Up-Right | |
| | Lines | DS03,04, 06,07,09, 11,12,14, 17,18,28, 30,31 | / | Schematic | Dark Red | Full | All surface | / |
| | | DS23,24, 25,27 | | | Red | | | |
| | Shaped formes | DS21 | U | Schematic | Red | Full | Center | / |
| | | DS01,02, 16 | X | Schematic | Dark red | Full | Up-Left | / |
| | | DS29 | Plus + | Schematic | Dark red | Full | Up-left | / |
| | Hand Symbol | DS19 | Right hand | Schematic | Red | Full | Up-Center | / |

## 7.1. Drawings

### *7.1.1. Scene 01*

Contain a person (DP01), with open legs, holding a spear (DT02); The scene is located in the upper right section of the surface and directed toward the top.

### *7.1.2. Scene 02*

Contain two hunters and tow buffaloes, while the two hunters (DP02, DP03) are pointing their weapons which are bows and arrows (DT03, DT07) and a stick (DT06) toward the buffalo (DA09), which has a long tail and closed horns filled on the interior, and in the other side, the hunter (DP09) is pointing his bow and arrow (DT13) toward the buffalo (DA08).

There are five drawings spread across the façade, representing hunters holding bows in a state of readiness to release or use them in a hunting process, these are the figures, DP04; DP05; DP06; DP 07 and DP10.

## 7.2. Engravings

*7.2.1. Scene 01*

Contain a person (CP01) holding a spear (CT01), facing a gazelle (CA04), alongside the representation of weapons, shields, spears, and sticks.

## 8- Scenes of Agriculture in the station

### 8.1. Drawings

*8.1.1. Scene 01*

Contain a buffalo (DA03) with straight horns pointed toward the top, buffalo pulling a plow (DT01), alongside some punctuation.

*8.1.2. Scene 02*

Contain a buffalo (DA10), with open horns, pulling a plow (DT10), with dotted markings possibly indicating plowing.

## 9- Scenes of Domestication

### 9.1. Drawings

*9.1.1. Scene 01*

Comprised of two ostriches (DA01, DA02), in the right side of the surface, represented with dark red color.

*9.1.2. Scene 02*

Contain four ostriches (DA04, DA05. DA06, DA07), which are gathered all together in the right section of the surface and are all directed toward one direction.

*9.1.3. Scene 03*

Contain a man (DP11) riding a bovine (DA16), alongside it is yet another bovine (DA17).

**Table 2:** Technical Study of the carvings

| Identification | Type | Codes | Item | Style | Technique | Carving | Spread | Direction | OBS |
|---|---|---|---|---|---|---|---|---|---|
| Zoomorfic | gazelle | CA06,07,11 | | Semi-schematic | Polishing | V | Right | Right | |
| | | CA03 | | Schematic | | | | | |
| | | CA17 | | Tazina | | | Center | | |
| | | CA22 | | semi-naturalistic | | | Up-left | | |
| | Canines | CA04,10 | | Semi-schematic | | | Law-left | Right | |
| | | CA21 | | | | | Up-right | | |
| | Pigs/Hogs | CA14,16 | | Semi-schematic | | | Up-right | Right | |
| | Ostriches | CA13 | | Shematic | | | Left | Right | |
| | | CA15 | | semi-naturalistic | | | | | |
| | Equines | CA08 | | Tazina | | | Left | Right | In movement |
| | | CA09 | | Shematic | | | | | |
| | Unidentified | CA01 | | Shematic | | | Left | Right | |
| | | CA02,05,12 | | Semi-schematic | | | | | |
| | | CA18 | | | | | center | | |
| | | CA19,20 | | | | | Right | | |
| Anthropo-morphic | humain | CP01 | | Shematic | Polishing | V | Left | Left | Holding a spear or baton |
| Weapons and tools | baton/spear | CT01 | | Shematic | Polishing | | Left | | |
| Symbolique Forms | | CS02,03,04 | X | Shematic | Polishing | V | Left | | |
| | | CS05 | Lines | Shematic | Polishing | V | center | | |
| | | CS01 | bow line | Shematic | Polishing | V | center | | |

## 10- Statistical study

The quality of the representations and methods used in the completion of the drawings and rock carvings at Margouma Station varied.

The statistical study enables us to know the environmental diversity that prevailed during the embodiment stage of rock drawings and engravings at Margouma station. In addition to knowing the extent to which humans depend on animal species or certain tools to meet their daily requirements in terms of social, economic, and cultural aspects. Also, this study shows us the extent to which man relies on certain methods to form these rock drawings and engravings.

**Table 3:** Styles statistiques

| **Styles** / **Nem/ %** | Naturalistic | Semi-naturalistic | schematic | Semi-schematic | Tazina |
|---|---|---|---|---|---|
| Nem- drawings | 00 | 33 | 31 | 00 | 12 |
| Percentage-drawing | 00% | 43.42% | 40.78% | 00% | 15.79% |
| Nem- engravings | 0 | 2 | 11 | 14 | 2 |
| Percentage-engravings | 0% | 6.89% | 37.94% | 48.28% | 6.89% |

**Table 4 :** The Statistical study of representations

| **Styles** / **Nem/ %** | Animal representations | Human representations | Tool representations | Symbolic representations |
|---|---|---|---|---|
| Nem-drawings | 18 | 11 | 16 | 31 |
| Percentage-drawing | 23.68% | 14.47% | 21.05% | 40.8% |
| Nem-engravings | 22 | 1 | 1 | 5 |
| Percentage-engravings | 75.86% | 3.45% | 3.45% | 17.24% |

## 11- Results

After processing the images taken from some parts of the station, it became clear to us that the drawn shapes, which used two different colors, light red and dark red, superimposed in some places, where humans used the light red color before the dark, and this is evident in the figure DS15, which is located in the lower part of the center of the facade, where The light red color appears clearly behind the dark red in the two upward lines from the right side of the figure, and this is repeated in several positions such as DA01; DP04; DS06 (Fig.4. n° 2), DS15 (Fig.4. n° 4), and DA01,03,04,05,06,07,09,10; DS06,08,15,22 (Fig.5. n° 1 and 4), While the engravings are placed above the rock drawings, as shown in Figures DS06; DP04,05; DA09 (Fig.4. n° 1.2 and 3), as well as in Figures DP05 and DS15 (Fig.5. n°2).

Conversely, the engravings are positioned above the rock drawings, as shown in figures DS06, DP04, 05, DA09 (Fig. 4, No. 1.2 and 3), as well as in figures DP05 and DS15 (Fig. 5, No. 2).

This superposition recurs at several points on the station's façade, particularly where the rock engravings overlap with the drawings in the lower part of the left side. Additionally, deliberate peeling of the outer layer is observed in other sections, alongside attempts to create additional engravings over the drawings; this is evidenced in Figure DA09 at the position of the buffalo's head and in other figures.

This overlay indicates that the station’s façade was reused on three different occasions. It cannot be definitively stated whether this usage occurred within a single period or across separate periods until in-depth analyses are conducted to determine absolute dates for the materials used in the drawings. However, it is evident that the light red rock drawings were executed first, followed by the dark red drawings, and finally the engravings (Fig. 4; 5).

Based on the data presented, it appears that Margouma station possesses many clues that allow for its classification through drawings and engravings separately. The drawings represented on the façade belong to the semi-naturalistic stage, owing to the variety of their sizes ranging from medium to small (Hachid. M 1982-1983), along with the presence of important anatomical characteristics such as those in figures DA15 and DA16, which indicate the animal's sex (male). Furthermore, some of the figures bear characteristics belonging to the Tazina school, such as the elongated extremities in Buffaloes DA09 and DA10, in addition to anthropomorphic figures, which are characterized by unclear anatomical features, while their heads end in a longitudinal shape drawn towards the back (Hachid. M 1982-1983).

The animal group depicted in the drawings indicates the bovine stage known as the Bovidien, dating between 4 K BC and 1.5 K BC (Lohte, Camps et Souville 1989) (Aumassip. G 1993). Here we find a group of buffaloes, fawns, and small bovine animals such as sheep and goats, in addition to ostriches. This is notable for the absence of large animals on the façade, such as elephants, rhinoceroses, and others. We can attribute this to the natural environment in which these drawings were made, as the station's location, distinguished by its altitude amidst mountain masses in a closed environment, does not allow for the presence of animals that move around in open environments.

This positioning of the station gave the person who made these drawings a panoramic view of his surroundings, just as he depicted the animals at different levels on the façade. This is similar to the overhead view shown in figures DA09 and DA10, which creates a surprising effect when viewed, as if the animals are spreading out beneath our eyes.

The engravings are characterized by their small size and thin, superficial lines, indicating that they are preliminary sketches for the completion of integrated rock engravings. Such sketches are found in many rock engraving stations of the Saharan Atlas and appear in various stages (Hachid. M 1982-1983). However, they certainly date to the Caballine stage (the Horse stage) or later, evidenced by the presence of the horse. This period extends, according to a number of researchers, between 1.5 K BC and 500 BC (Lohte, Camps et Souville 1989) (Aumassip. G 1993), as seen in Figure CA09.

We notice on the station’s façade that humans executed these engravings in the lower left part, thereby avoiding placing them over the drawings. Some of them were left incomplete for this same purpose, as seen in the overlap between Figures DP05 and CA15, where the upper and lower parts of the arc were erased, while the middle part remained clear.

Over time, the Margouma façade was exposed to two types of factors: natural and human. The latter appears in several parts of the surface, where attempts to create new engravings directly affected the drawings, parts of which were erased.

Natural effects are visible in the color change of the rock façade. On the right side, we clearly notice traces of water runoff resulting from seasonal weather (Fig. 5, in 3, W), which extends to the lower half. Conversely, the upper left part retained its color because it is more concave and, therefore, more protected. This coloration typically results from the taphonomic evolution of the quartzite and sandstone wall exposed to the elements, often affected by physico-chemical and microbiological alterations (Hachid, 2014). Microbiological changes were observed in the center of the interface, where the growth of some fungi caused the surface color to change to green (Fig. 5, in 3, B).

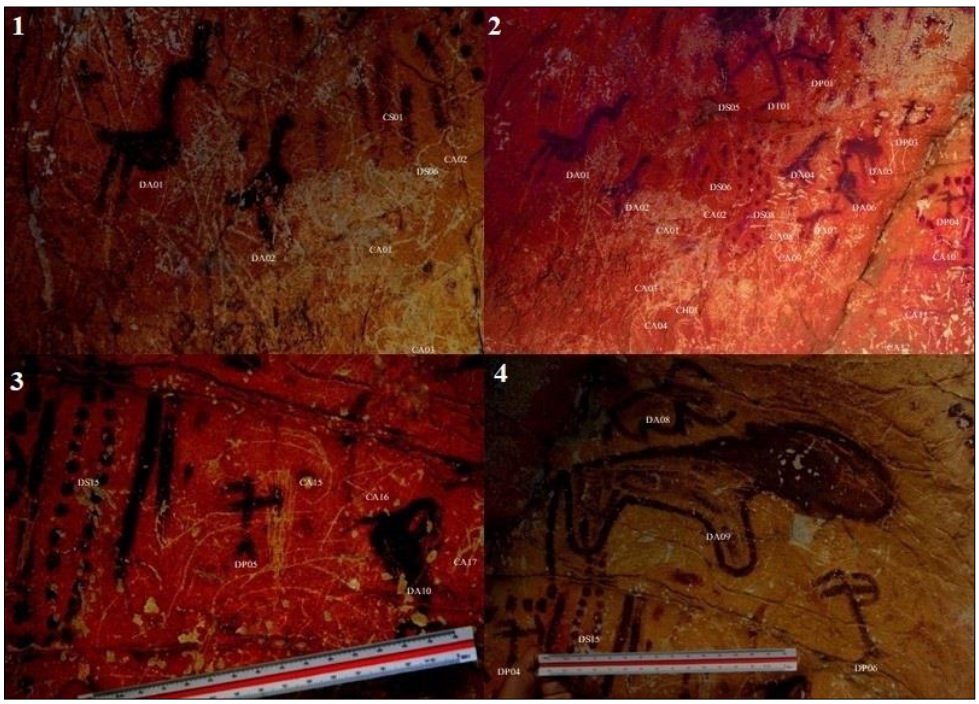
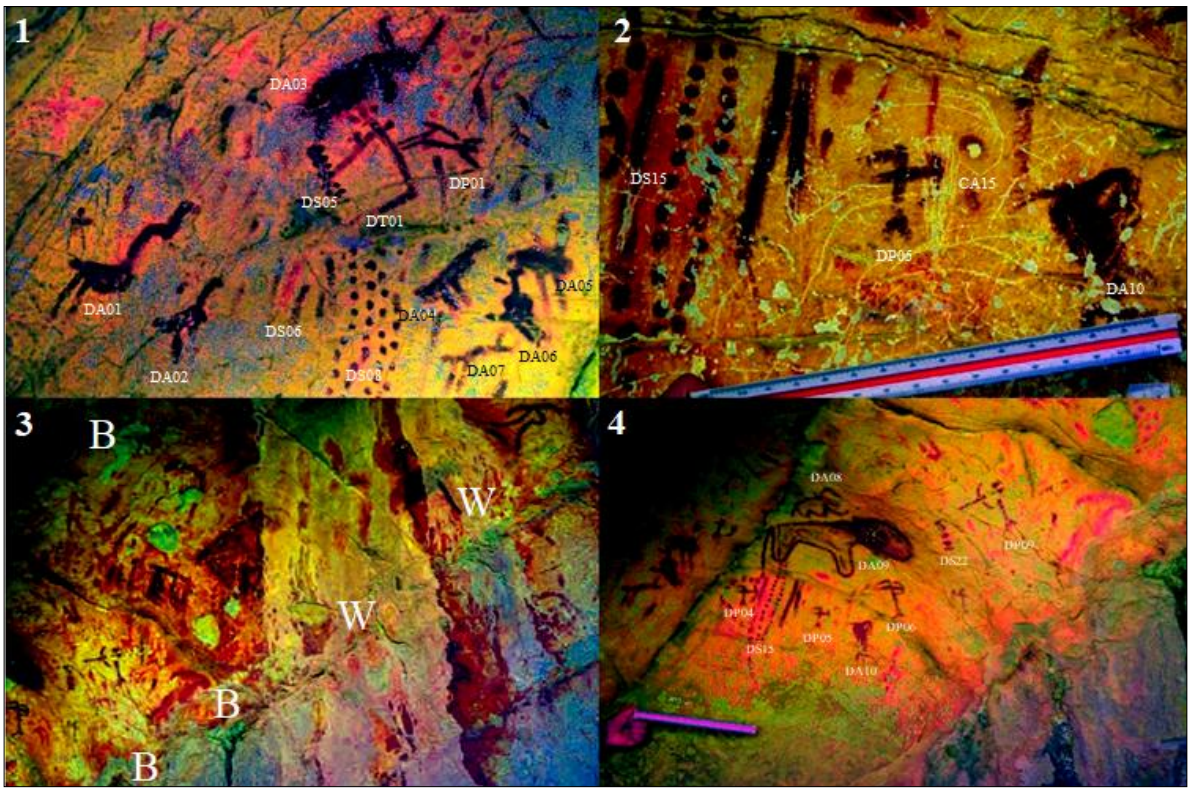

1
CS01
CA02
DS06
DA01
DA02
CA01
CA03
2
DP01
DS05
DT01
DP03
DA01
DA04
DA05
DS06
DA02
CA02
DS08
DA06
DP04
CA01
CA08
CA10
CA11
CA04
CH01
3
DS15
CA15
CA16
DP05
CA17
DA10
4
DA08
DA09
DS15
DP04
DP06

**Fig. 4.** Details of the facade showing the superposition of the drawing colors and ther overlay onengravings, Image processing by Adobe Photoshop.

**Fig. 5.** Details of the facade illustrating the superimposition of representations and weathering




effects on the surface layer. Images processed using DStretch.

## Conclusion

In this article, we present a descriptive study of Margouma station, based on an artistic and technical analysis of its archaeological content, which consists of 105 rock drawings and engravings. The station is also characterized by a variety of methods used in the execution of representations, whether drawings or engravings, such as the semi-naturalistic, Tazina, schematic, and semi-schematic styles. However, the semi-naturalistic style dominates the majority of the representations, particularly the drawings. These drawings are executed in medium and small sizes and in two different colors, where the dark red pigment is observed placed above the light red. In some representations, we noticed that the latter forms a background for the drawn animals, as if the artist redrew over pre-existing forms. This is evident in figures DA04, DA05, DA06, and DA07, which comprise a group of four ostriches located to the left of the station.

The study of this station enabled us to identify many aspects of the daily life of man in that period, as he depicted multiple scenes, expressing his practice of

several activities such as hunting, battle, domestication, agriculture, and animal transport. He also highlighted specific biological details, such as the gender of the animals he relied on for transport (male), as is evident through the anatomical characteristics in Figure DP11, and headgear in the form of a hat or a mask in Figure DA16.

The rock engravings feature multiple themes and diverse forms, depicting animals such as deer, dogs, horses, pigs, and ostriches. Almost all of these figures are in a state of movement (running). Human representations, however, were limited to a single form (CP01), a figure bearing a spear mounted on the right side, parallel to the body. This position may indicate grazing.

This is the first comprehensive study of Margouma station, and we acknowledge that it cannot cover all its archaeological aspects, particularly regarding the absolute definition of the cultural and chronological framework. Although the superposition of figures demonstrates that the station was exploited during different times, determining these specific periods remains difficult without resorting to absolute dating. Therefore, we strongly recommend that future research include a chemical analysis of pigment layers and the application of radiocarbon dating (C14) to any organic materials that may be discovered at the site. Until such absolute data is available, however, we attribute the site to the Bovidien and Caballine stages based on the stylistic methods used in executing the subjects and the faunal assemblage represented on the façade.

When comparing Margouma station with other sites in the Saharan Atlas, particularly in Djelfa, Laghouat, and Biskra, significant stylistic and chronological parallels emerge. The distinct "Tazina style" identified at Margouma, characterized by small-scale figures with finely polished lines and elongated extremities, is a hallmark of Djelfa rock art, notably present at sites such as Gada Djellada and Wadi Mzi (Hachid. M 1992) (Aumassip 2004). Regionally, within the Biskra (Ziban) basin, Margouma shares hydrographic and cultural traits with Chabet Naïma on the Oued Ittel. As highlighted by Amara (Amara 2020, 84-91), both sites illustrate a pastoral context and the transition from the Bovidien to Caballine stages. Furthermore, stylistic similarities in human figures at Chabet Naïma link it to the Oued Dermel region, underscoring the broader artistic homogeneity across the Saharan Atlas during this period.

Despite these regional similarities, this station possesses unique characteristics not found in other stations of the Saharan Atlas, owing to the fact that it contains numerous themes that can guide us to new insights regarding the study of rock art, particularly through the reliance on topographical context when analyzing the positioning of formations on the rock façades. Based on the

foregoing, it can be stated that Margouma station is a distinctive archaeological witness to the succession of prehistoric human settlement in the Ziban region, serving as clear evidence of daily human activities reflecting this continuity. However, many questions remain regarding this station, necessitating in-depth studies in the future.

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