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## DISCOVERY OF A NEW OPEN-AIR PREHISTORIC SITE IN TRUBAH, NORTHERN SAUDI ARABIA

**ABSTRACT:** Northern Saudi Arabia is regarded as one of the primary regions for prehistoric archaeological sites in the Arabian Peninsula. Extensive archaeological surveys and excavations conducted over a long history of research have revealed varying chronologies for Palaeolithic and Neolithic sites. These sites are found mainly in the Nefud Desert and volcanic landscapes, and they exhibit diverse lithic technologies, including resemblances to Acheulean, Levallois, and Neolithic productions known in central and northern Arabia. Some of these sites also display technological elements similar to those found in the Levant and Africa.

Although large-scale surveys and excavations of prehistoric sites have been conducted in northern Saudi Arabia, many areas still lack extensive survey coverage and comprehensive comparative studies. This research presents a newly discovered open-air prehistoric site, identified in Trubah, northern Saudi Arabia. The site's location and surface artefact distribution reveal substantial evidence of prehistoric occupation, including Acheulean and Middle Palaeolithic horizons. Lithic classifications and measurements indicate a predominance of Acheulean and Levallois stone tool production. The data recovered from the site offer a new perspective on long-term Palaeolithic habitation by different cultural groups.

**KEY WORDS:** Saudi Arabia - Paleolithic - Acheulean - Levallois - Nefud - Lithic

### INTRODUCTION

Prehistoric studies in Saudi Arabia have expanded during the last decades, and many research projects have been established, and dozens of Palaeolithic and Neolithic sites have been documented (Groucutt *et al.*

2014, Bailey *et al.* 2015, Petraglia *et al.* 2010, Alasmari 2019). The comprehensive archaeological surveys and excavations in northern Saudi Arabia reveal a series of Palaeolithic sites spread across vast areas and varied landscapes (Petraglia *et al.* 2019). Some Palaeolithic sites were found at the foot of volcanic mountains and

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*harrats* (volcanic fields), and many of them were found in the Nefud Desert, within the deposits of Middle Pleistocene sediments, particularly in the Al-Jawf and Ha'il regions of northern Saudi Arabia (Roberts *et al.* 2018, Hilbert, Crassard 2020, Nassr *et al.* 2022).

The prehistoric research projects conducted recently in Ha'il and Al-Jawf have illuminated the general picture of prehistoric archaeology in northern Saudi Arabia; however, there are large areas in both regions still unexplored. The initial discoveries of heritage by archaeological missions, Saudi Heritage Commissions, and the Saudi Royal Reserves revealed diverse Palaeolithic sites in northern Saudi Arabia, spanning across the major Palaeolithic periods, and reflecting various occupation patterns and different climate changes during the Pleistocene and Holocene (Parker 2010, Jennings *et al.* 2015).

The Palaeolithic sites found in the Nefud desert, Jubbah Basin, and Dūmat al-Jandal have emerged as major localities of Palaeolithic records in northern Saudi Arabia; they are revealing a significant treasure pool of Palaeolithic chronology and characteristics (Jennings *et al.* 2016, Scerri *et al.* 2018).

The main features of Lower Palaeolithic sites in northern Saudi Arabia are Acheulean large cutting tools and cores, mainly mode 2 Acheulean tradition, including Middle and Late Acheulean (Nassr, Elhassan 2020, Scerri *et al.* 2021). The Acheulean handaxes were discovered on the surface, and many of them were found associated with middle and late Pleistocene deposits and dated by OSL dating to 400–200 ka (Groucutt *et al.* 2021). The Acheulean sites found in northern Saudi Arabia are dated to the Middle Pleistocene in general, and they are young compared to East Africa, such as the site of An Nasim, which presents typical Acheulean traditions and is dated to 337–301 ka (Scerri *et al.* 2021).

The predominant Acheulean artefacts recovered are bifaces from the areas of the Jubbah and the Nefud, such as the site of An Nasim, Jebel Katefeh 8 (KF-8). Handaxes are the typical Acheulean stone tools identified from the area of northern Saudi Arabia, presenting the major characteristics of bifaces from sharp edges and large flakes removed from around the bifacial platform edges towards the centre with pointed ends. They were manufactured from ferruginous quartzite sandstone, cherts, and basalt (Scerri *et al.* 2021, Nassr *et al.* 2025).

The Acheulean sites found in the volcanic mountains and *harrat* fields provided a surface for large-scale cutting Acheulean artefacts; however, the Acheulean lithics found along the Nefud Desert are more characterized

by typical bifaces and late Acheulean features, including foliate handaxes (Shipton *et al.* 2018). The Nefud Desert is one of the major areas in northern Saudi Arabia that yielded vast localities of Palaeolithic archaeology, including Acheulean and Middle Palaeolithic (Scerri *et al.* 2015). The archaeological surveys and excavations in this region (Nefud) have unveiled fossils and footprints associated with Palaeolithic artefacts in the landscape of paleolakes and rivers (Breeze *et al.* 2017, Stewart *et al.* 2020). The major Palaeolithic sites found in the Nefud presented Acheulean and Middle Palaeolithic artefacts in one site, which indicated long-term occupations or reoccupations of Palaeolithic in northern Saudi Arabia (Groucutt *et al.* 2021).

The Middle Palaeolithic (MP) was discovered mainly in the Nefud area, and some of them were found associated with Acheulean sites, such as in the Jubbah basin and Dūmat al-Jandal areas (Groucutt *et al.* 2017). MP in northern Saudi Arabia is characterized by the dominance of mode 3 (prepared Levallois productions) with few presences of retouched stone artefacts including side scrapers and points (Scerri *et al.* 2015, Marks 2023). Levallois stone productions and retouched blade affinities were discovered from multiple sites in Arabia, such as the Jubbah areas in northern Arabia (Derevianko 2016). Lithics studied are supported by chronometric dating and paleoenvironment research, contributing to broader discussions of modern human presence and spread in northern Arabia during the middle and late Pleistocene eras (Scerri *et al.* 2021).

The major MP sites in northern Arabia are found in Al Maraat Basin and Khall Amaysham 4 (KAM4) (Groucutt *et al.* 2017). The blade productions documented in several Palaeolithic sites in northern Arabia and mainly found associated with the Levallois context indicate late MP extensions in the area (Guagnin *et al.* 2017). The MP sites found in Jubbah, found in stratified material dated to 211–75 ka, showed Mousterian and Levallois points, prepared cores, and retouched flakes as the major MP lithic productions (Petraglia *et al.* 2012).

Despite extensive discoveries of Palaeolithic archaeology in northern Saudi Arabia, there is a lack of comprehensive studies of the lithics and reconstruction of paleoenvironment, and there are many areas that remain unexplored. On the other hand, there is a lack of comprehensive comparison studies of the Palaeolithic sites distributions and lithic productions (Sadig, Alasmari 2022).

This study is trying to present the context of a new Palaeolithic site discovered recently, which contains

characteristics of Acheulean associated with MP artefacts. The study will focus on the site landscape, lithics scattered, lithic classification, and metric measurements.

#### Trubah Palaeolithic site location and survey methodology

Based on the landscape of northern Saudi Arabia and the results of the satellite archaeological survey, an archaeological survey was conducted in the Trubah region to visit an area located in the middle of highlands

and on the edge of a depression (*Figure 1 and 2*), resembling the landscape of Palaeolithic sites found in northern Saudi Arabia (Scerri *et al.* 2021).

The archaeological survey was carried out during February 2025 to visit the area and explore the archaeological context from the surface. The ground systematic archaeological survey revealed an important Palaeolithic site. The site is located close to a rocky sandstone mound and on the margin of a depression (*Figure 3*). The stone artefacts, including Acheulean



FIGURE 1: Location of the Trubah Palaeolithic site in northern Saudi Arabia.



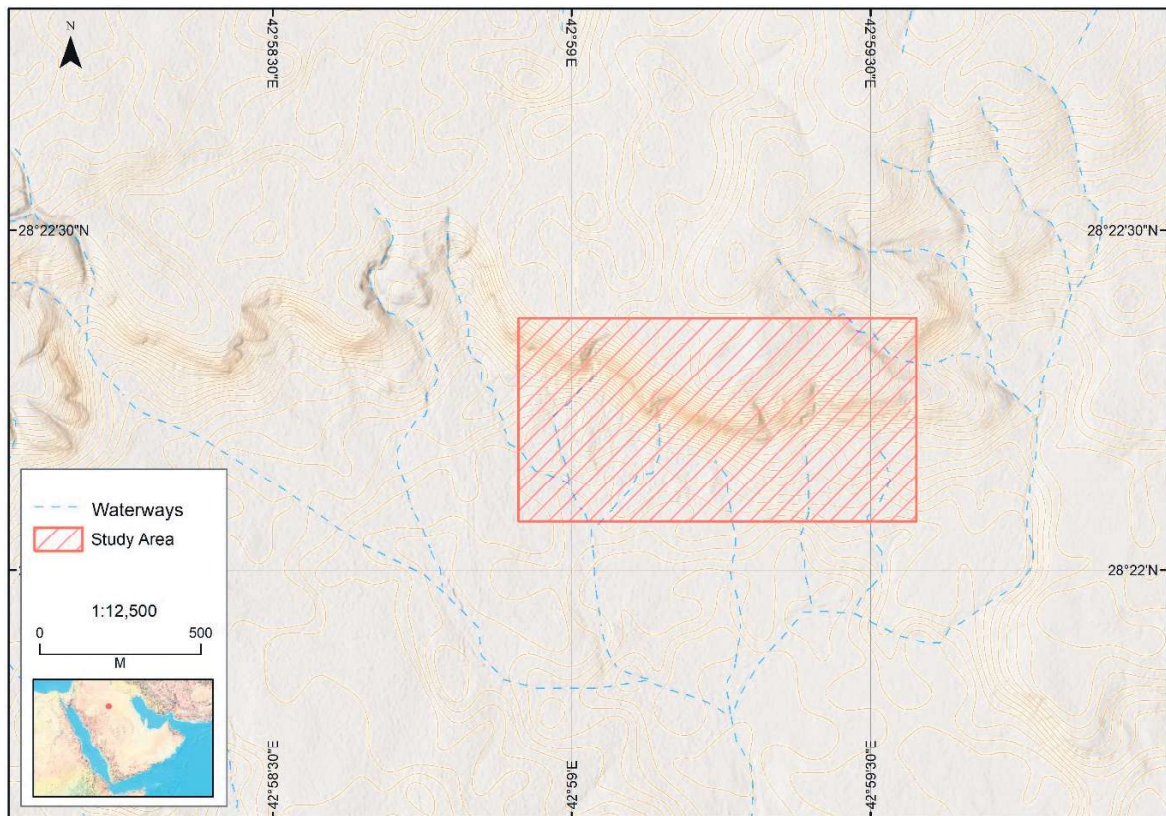


FIGURE 2: Location of the Study Area.



FIGURE 3: Aerial view of the site landscape.



bifaces, cores, flakes, and MP stone productions, covered the site surface average of  $400 \times 500$  meters.

Lithics were found in the vast area; they were scattered on the foot of the isolated sediment mound and concentrated in some parts of the site, mainly accumulated within the outcrops and in the profiles of water channels.

Several handaxes were found on the surface, and some of them were buried by alluvial sediments as well. Acheulean flakes, cores, and bifaces were scattered in many parts of the site. The MP artefacts found within the spread of the Acheulean vicinity, however, a high concentration of late MP artefacts were found at the foot of the rocky mound.

The site clearly demonstrates the region's importance in revealing the spread of Palaeolithic groups in northern Saudi Arabia and opens a new window for comparative studies between the regions of Saudi Arabia and the Levant, based on the hypotheses proposed regarding the expansion of Palaeolithic groups into northern Arabia (Petraglia *et al.* 2019).

General observations were gleaned from regular walking on the site surface. The area for systematic ground survey was chosen based on lithic concentrations and techno-complex diversities, with a judgmental sampling strategy including random and systematic collections focusing on gentle outcrops and artefact accumulations. Lithic assemblages were documented in the field, according to their primary and secondary positions on the surface or buried by alluvial sediment in the channel profiles. The systematic survey carried out on the site by chosen  $5 \times 5$  meters area to collect the assemblage of general artefacts including Acheulean and MP assemblage, and  $1 \times 1$  meter in the middle of MP lithic concentrations.

The lithics are classified by the identification of stone tools, metric measurement of flaking scars on axes, examination of striking platform patterns, and the overall morphology of lithic dorsal, ventral, and angles, worked and retouched edges, pointed, and butt shapes. As well, lithic accounting is based on their agglomeration on the surface and within the outcrops. The artefacts gathered randomly for study were selected according to their diversities in technology class, typology, size, conditions, and concentrations. This strategy has been changed according to the quantity of the artefacts on the surface and supported by systematic survey collections.

The lithic classification was established to describe the major characteristics of technology and typology, with comparison of the technology and typology with

the published data about Palaeolithic archaeology in the region (Crassard, Petraglia 2014). The Acheulean artefacts are identified by the presence of Mode 2 (bifaces) and Middle Palaeolithic stone tools, distinguished by the presence of Mode 3 (prepared Levallois productions). With descriptions of core types, flake size and shapes, and platform types. Results of the classifications of the artefact compared with the familiar Acheulean and Middle Palaeolithic sites in northern Saudi Arabia, such as the Jubbah basin.

### **Ground survey results**

The ground archaeological survey revealed that the site is a major Acheulean and MP occupation. The spread of the artefacts on the surface is high and varies; some of the handaxes and Levallois cores were found in concentrations close to sandstone mounds and within the outcrops, whereas other bifaces and classical Levallois core points, flakes, and blades were documented in scattered single finds within the spread of the Acheulean artefacts and in concentrations on the tops of isolated small mounds. Several handaxes and Acheulean flakes were documented on the surface, some of which were buried partly by recent sand (*Figure 4*).

The MP artefacts also documented on the site surface showed that the site was occupied during the early and late MP. The Levallois productions, including prepared cores, points and retouched Levallois flakes, are well documented on the site surface (*Figure 5*). On the other hand, high concentrations of Levallois small flakes, blades, and debitage were found in many parts of the site.

The margin of the site close to the depression has been affected by wadi erosion; some of the lithics were found in the depression bed, and some of them had been stacked in different positions. The lithic spread was affected by climate changes and desertification for a long time. Many of the lithics were buried by Holocene sediments and recent sand; however, some of the flakes that came from recent shafts of exposed wadi sections were fresh and presented the original rock patina of the cherts. The lithic accumulation on the surface and buried by sediments indicates the possibility for stratified Acheulean and MP contexts in the site. The site landscape and artefacts distribution on the surface presented an open-air Palaeolithic occupation showed similarities with Palaeolithic site landscapes in the Nefud desert (Groucutt *et al.* 2018). The majority of the artefacts provided resemblance to the major Paleolithic sites in the area, bifaces are similar to Acheulean tradition in An Nasim sites (Scerri *et al.* 2021), Middle

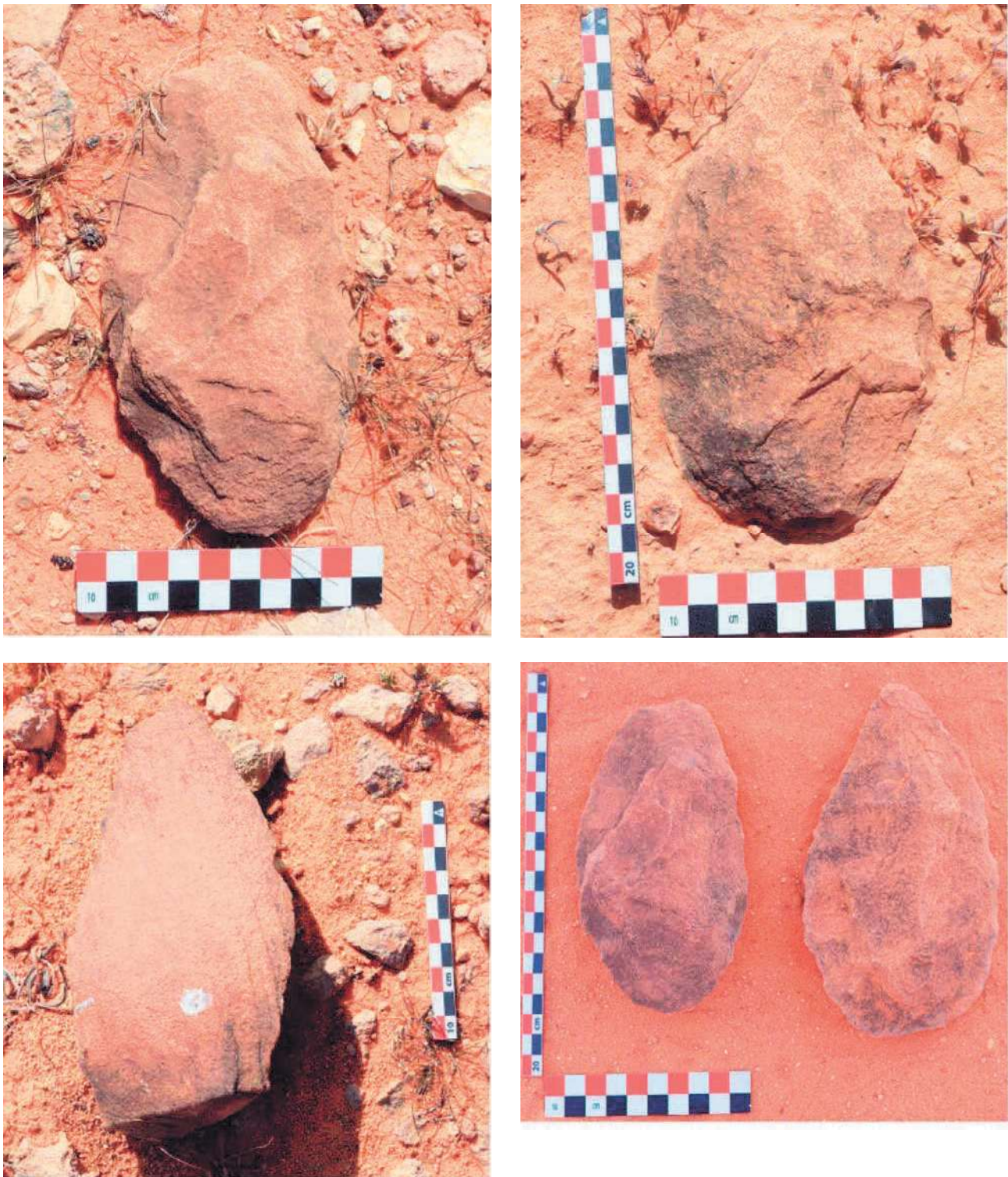


FIGURE 4: General view of the Acheulean artefacts found on the surface.



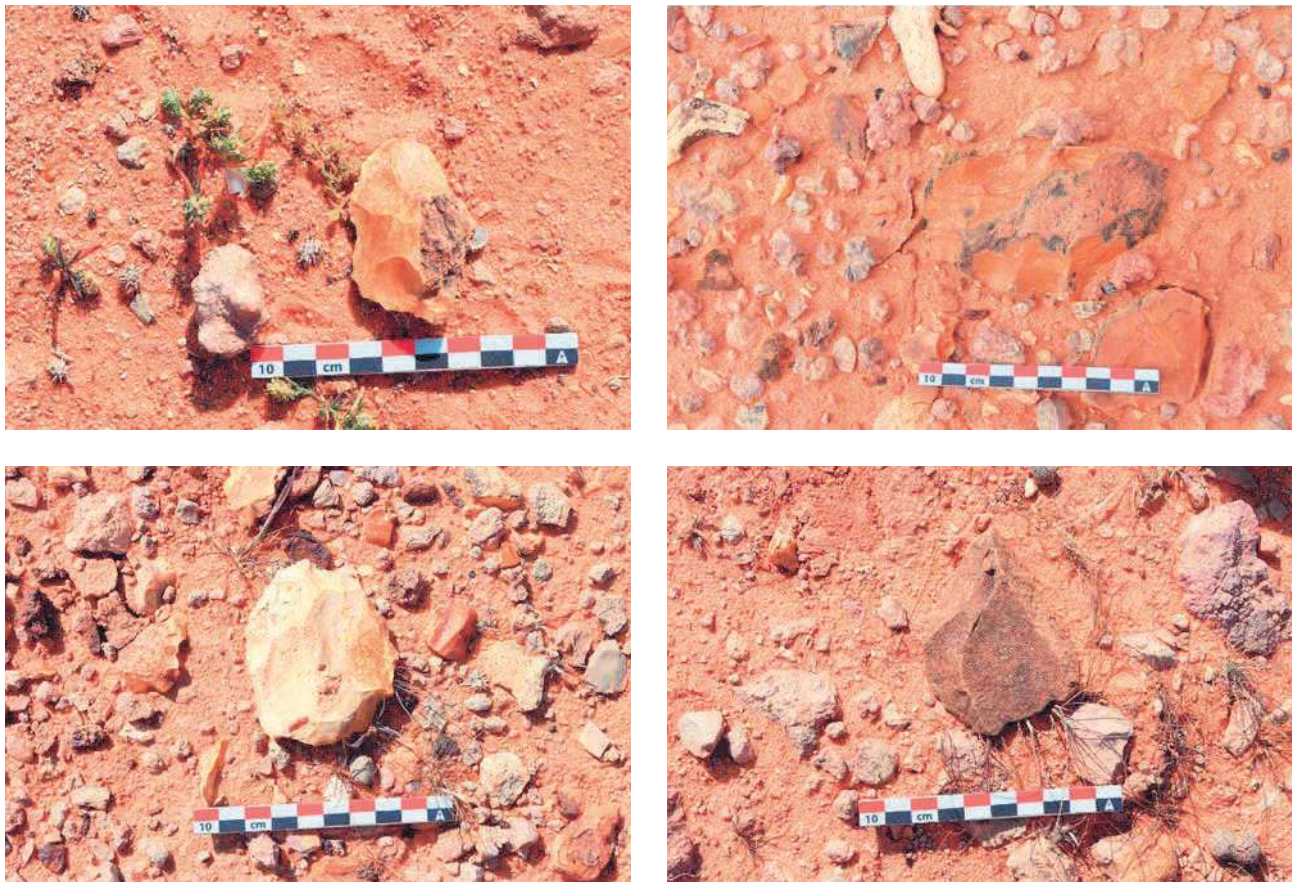


FIGURE 5: Diversity of Middle Palaeolithic artefacts gathered from the site surface.

Palaeolithic artefacts compared to the site of Jebel Katefeh in Jubbah basin (Groucutt *et al.* 2014). As well as there are some materials also similar to late Palaeolithic and early Neolithic in the site of similar to the finds of the site I-Rabyah, which was dated to the terminal Pleistocene and early Holocene 12.2 – 6.6 ka (Hilbert *et al.* 2014).

The lithics were made from local raw material; 70% of the lithics were made from hard and fine cherts, and about 30% of the lithics were made from mudstone, basalt, and sandstone. Acheulean artefacts were mainly made from fine chert, mudstone, and basalt; however, the MP artefacts were mainly made from hard, fine cherts, basalt, and a few of them were made from sandstone.

The lithics collected from the 5 × 5 meter surface cleaning presented clear examples of the Acheulean and MP artefacts distributions on the site surface (Figures 6, 7), with an estimation of the lithics scattered and occupation size of the site (see Table 1). Studying

the spread of lithics on the surface helped in identifying the major chronology of the site, the current condition of the site, and the extent of its exposure to erosion processes.

The assemblage gathered from 1 × 1 meters in the middle of the MP concentrations presented different horizons of MP (Figure 8). Whereas the early MP artefacts presented by Levallois cores and points were found associated with high accumulation on the site surface. And the late MP productions presented by small Levallois flakes and blades. The MP in general presented the majority of Levallois productions in the site very similar to the MP site contexts in the Nefud desert and Ha'il region (Nassr *et al.* 2025; see Table 2).

## LITHIC CHARACTERISTICS

The general characteristics of the lithics observed on the site surface and gathered from the systematic





FIGURE 6: 5 × 5 meters surface collection in the eastern part of the site.

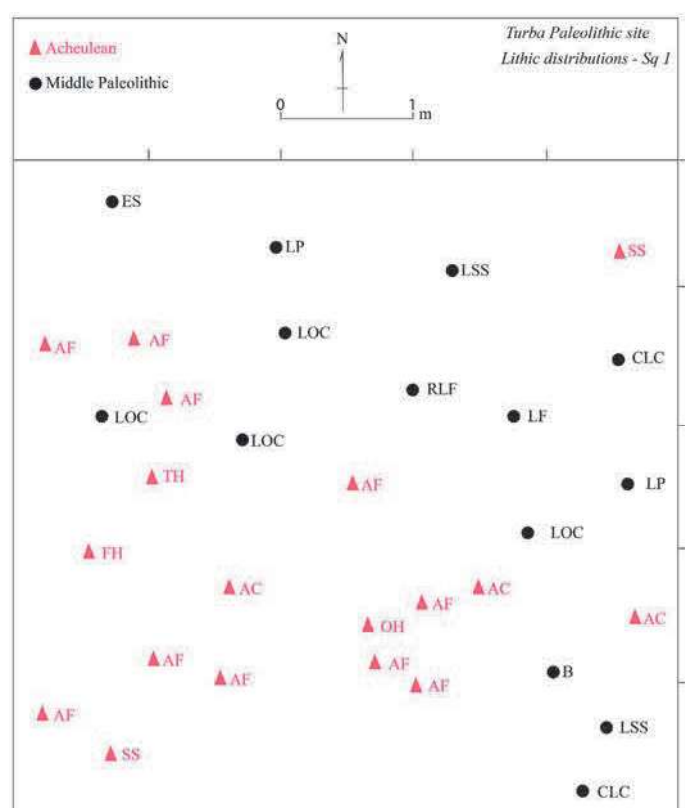


FIGURE 7: Lithic distribution based on the typological description of lithic gathered from 5 × 5 meters on the site surface in the eastern part of the site: (CLC) Centripetal Levallois Core; (LSS) Levallois side scraper; (AC) Acheulean Core; (AF) Acheulean Flake; (OH) Oval Handaxe; (SS) Side scraper; (AC) Acheulean Core; (FH) Foliate Handaxe; (TH) Typical Handaxe; (LOC) Levallois oval core; (ES) End scrapers; (LP) Levallois points; (RLF) Retouched Levallois flake; (B) Blade; (LSS) Levallois Side Scraper).



TABLE 1: Lithic measurements and technology gathered by 5 × 5 meters from the site surface. N, number of pieces.

Lithic class	N	Predominant Platform	Average cortex (%)	Length (Max - Min) (cm)	Width (Max - Min) (cm)	Thickness (Max - Min) (cm)	Scar account Max - Min (Face 1 - Dor)	Scar account Max - Min (Face 2 - Ven)	Major characters
Acheulean Core	4	Cortical/ Facetted	40%	18.8 - 12.2	14.2 - 5.4	8.8 - 2.3	9 - 4	8 - 3	Large cutting cores, including oval and pear-shaped with large and deep scars of flakes removed by hard hammer from facetted and cortical platforms. They are including large blank and giant Acheulean cores.
Oval Handaxe	1	Facetted	30%	15.7	8.9	5.6	12	7	Oval shape with cutting edges.
Typical Handaxe	1	Facetted	10%	13.5	9.4	4.3	15	9	Lanceolate form with pointed ends and cutting edges.
Foliate Handaxe	1	Facetted	10%	8.3	4.6	1.7	9	5	Made on a small blank with worked butts and edges and pointed.
Acheulean Flake	9	Facetted/ Plain	10%	9.5 - 7.6	6.6 - 5.3	3.3 - 2.2	5 - 1	4 - 0	Different shapes of Acheulean flakes removed from multiple platforms.
Levallois oval cores	4	Cortical/ Plain	15%	8.9 - 5.7	8.5 - 3.5	3.5 - 0.8	10 - 4	6 - 3	They are distinguished by the oval shape with deep scars of Levallois flakes removed by hard hammer from multiple platforms. Some of them showed worked cutting edges.
Centripetal Levallois Core	2	Facetted	10%	5.3 - 4.5	3.5 - 3.2	1.3 - 0.8	15 - 6	5 - 3	Preferential Levallois cores with centripetal preparation and denticulate retouched.
Levallois points	2	Facetted	10%	5.9 - 3.2	3.4 - 2.3	2.3 - 0.5	8 - 6	2 - 2	Triangular shape with pointed end and prepared butt.
Levallois side scrapers	2	Facetted	20%	8.3 - 7.5	6.5 - 4.2	2.8 - 2.6	8 - 5	4 - 3	Retouched Levallois side scraper with worked back.
Side scraper	2	Facetted	25%	9.2 - 6.3	8.3 - 3.4	2.6 - 0.7	11 - 3	5 - 2	Retouched side scraper.
End scrapers	1	Facetted	15%	5.6	4.3	2.1	5	4	Made on Levallois flakes
Levallois Flake	1			8.8	4.6	3.4	3	2	Levallois flakes of different shapes and sizes removed from multiple platforms, flat on one side, and have sharp cutting edges.
Retouched Levallois flake	1	Plain	5%	4.5	2.4	0.5	9	5	Largely retouched on the.
Blade	1	Plain	5%	5.5	2.3	0.7	7	2	Created from multiple striking platforms. They are thin and sharp edges.

survey are Acheulean and MP. The Acheulean artefacts represented a majority of bifaces, including ovate handaxes, typical handaxes, small handaxes, and foliate handaxes, with a few presence of Acheulean knives, scrapers, and cleavers. Typical and foliate handaxes

constitute the primary inventory of Acheulean stone tools within the assemblage, showcasing a variety of Middle and Late Acheulean artefacts resembling Acheulean traditions found in Jubba and Ha'il (Scerri *et al.* 2021, Nassr *et al.* 2025).

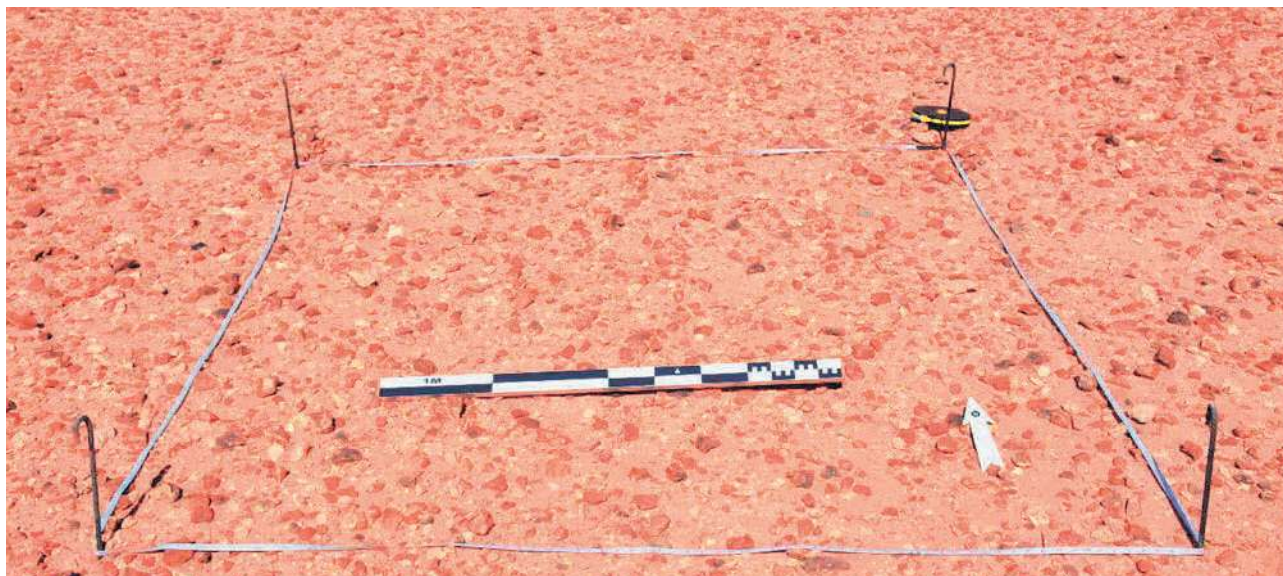


FIGURE 8: 1 × 1 meters MP surface cleaning in the middle of the site.

Acheulean large cutting tools (LCTs) presented one of the major lithic traditions in the site, they display extensive deep and large flake scars, removed from multiple platforms. The large bifaces, including ovate handaxes and cleavers, presented large, deep flaking scars and cutting edges. However, the typical and foliate handaxes exhibit widespread flake scars on both sides of the tools, removed from straight platforms. Acheulean bifaces are the principal technological type of the Lower Palaeolithic in the site, with the presence of foliate handaxes, side

scrapers, and knives constituting the secondary Acheulean class within the assemblage in the site (*Figure 9*).

The Acheulean class characterized by lanceolate form and pointed ends, especially the handaxes, and mostly produced from large flakes; however, there are some tools crafted from Acheulean giant cores. The Acheulean flakes observed on the surface, indicated of local workshops, whereas Acheulean cores and large bulk knapped pieces were also found at the site. The Acheulean lithics generally exhibit more weathered



FIGURE 9: Acheulean artefacts characteristics from the site.



TABLE 2: MP Lithic classifications and measurements collected by 1 × 1 meters from the site surface.

Lithic class	N	Predominant Platform	Average cortex (%)	Length (Max – Min) (cm)	Width (Max – Min) (cm)	Thickness (Max – Min) (cm)	Scar account Max – Min (Face 1 – Dor)	Scar account Max – Min (Face 2 – Ven)	Major characters
Centripetal Levallois cores	20	Cortical/Faceted	30%	8.5 – 6.3	6.5 – 3.2	2.8 – 0.8	12 – 8	5 – 4	Flat and discoidal shape with preparation edges, deep scars, and worked sides.
Levallois oval cores	12	Facetted	20%	5.8 – 3.2	4.6 – 2.3	3.2 – 0.6	9 – 6	5 – 3	Flatted shapes with prepared ends, some of them had a retouched edge.
Levallois Core of points	7	Facetted	15%	7.2 – 3.6	5.2 – 2.5	3.1 – 0.6	11 – 7	10 – 5	Predetermined shapes with flake scars centripetally removed around the edges.
Levallois points	12	Facetted	10%	5.6 – 3.5	3.5 – 2.4	1.9 – 0.6	5 – 3	3 – 2	They have a triangular shape with a pointed end and largely retouched form both sides.
Levallois flake	17	Facetted and Plain	5%	5.2 – 2.6	3.1 – 2.1	1.7 – 0.4	6 – 4	4 – 2	Levallois flakes of different shapes and size removed from multiple platforms, mainly flat on one side and share edges.
Retouched Levallois flake	12	Facetted	5%	5.7 – 2.9	5.4 – 2.3	2.8 – 0.4	9 – 5	5 – 4	They presented worked backs and retouched edges.
Levallois side scrapers	10	Facetted	20%	7.8 – 4.8	5.6 – 3.7	3.2 – 1.5	12 – 6	7 – 3	Large cutting edges and some of the retouching in non-continuous.
End scrapers	8	Facetted	10%	4.9 – 3.7	4.4 – 2.5	1.8 – 0.5	10 – 5	6 – 2	Made on Levallois flakes with prepared retouched ends.
blade cores	5	Facetted and Plain	10%	7.2 – 4.6	4.1 – 2.8	1.5 – 0.4	11 – 8	7 – 3	Conical or pyramidal in shape; with regular scars of blade removed to a certain degree and preparations of facetted platforms.
Blades	11	Plain	5%	5.4 – 3.5	2.6 – 1.9	0.9 – 0.3	7 – 5	5 – 1	Made from a straight platform and has pointed terminations.
Shatter	49	Polyhedral	10%	7.5 – 2.3	4.5 – 1.5	2.6 – 0.2	7 – 3	2 – 0	Different in shapes and sizes, including chunks and debitage of Levallois and blade productions.

surfaces than the MP artefacts. Technologically, the Acheulean lithics gathered from the survey were distinguished by bifaces, with Acheulean cores exhibiting various patterns, including Tear-Drop, multiple platform cores, and single cores. The size and preparation scars of the flakes provide insight into understanding biface technology at the site, which indicates that the

Acheulean long blanks were crafted by hard hammer from the cores to produce bifaces. This is corroborated by the presence of scattered large flakes on the surface of the sites and knapping traces identified on the hard hammer stones made from cherts.

The MP artefacts density was found within the context of Acheulean and separately on the foot of the

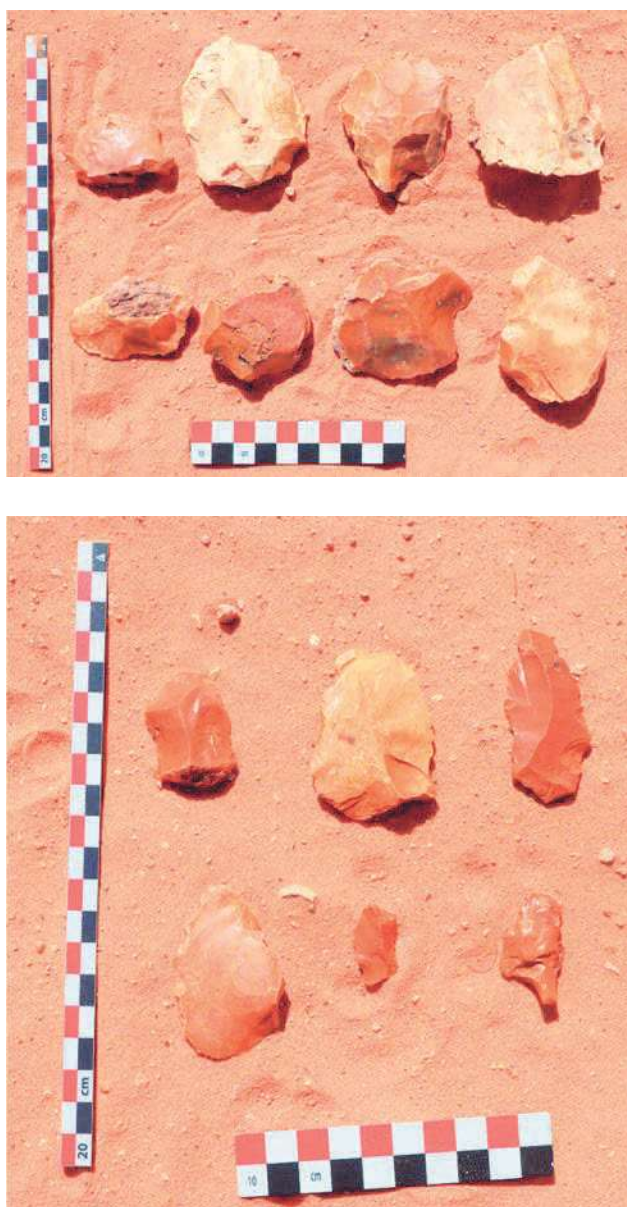


FIGURE 10: Middle Palaeolithic cores, flakes, and tools diversities from the site.

rocky chert mound. They presented two types of MP artefacts based on the artefacts size, platforms, and flaking scars. The first MP characterized by large oval cores of Levallois and Centripetal Levallois cores and scrapers. This horizon is found mainly mixed with Acheulean artefacts, which indicate that the site is also occupied during late Acheulean. The second MP represented by small prepared Levallois cores, points, retouched Levallois flakes, and blades (*Figures 10, 11*).

This type of MSA is very similar to middle and late MP cultures known in northern Arabia (Scerri *et al.* 2015, Hilbert, Crassard 2020).

The MP traditions are sparsely represented; the majority are the Levallois production and blade production, and retouched artefacts are minimally represented, comprising only 10% of the MP lithics at the sites. The Levallois prepared cores, scrapers, and points constitute the major patterns. The MP lithic sizes and preparation methods highlight a discernible relationship between raw material type and techno-typological characteristics. The large Levallois cores and scrapers made from basalt are notable for their large size, fashioned through a preferential technology involving the removal of a single predetermined deep flake from a specific flaking surface. Conversely, the late MP including points and retouched flakes, are fashioned from chert and characterized by the removal of a series of predetermined small flakes from a designated flaking surface on both opposing faces. The forms of MP lithics varied and presented different types, including points, scrapers, retouched flakes, and prepared cores. The general criteria of MP in the site are resemblance to the MP traditions found in many sites in northern Arabia, mainly similar to MP in the Jubbah basin (Groucutt *et al.* 2017).

## CONCLUSION AND REMARKS

The archaeological survey conducted at the site of Trubah revealed a Lower and MP site of great importance for Palaeolithic studies in northern Arabia. The lithic accumulation on the site surface, including Acheulean and MP indicates that the site was occupied by various groups. The systematic surveys provided a massive accumulation of stone artefacts on the surface, and the observation of several tools and flakes buried by alluvial sediments indicated the possibility of finding stratified material at the site and encouraged large-scale excavations in the future.

The general techno-typological characteristics of the lithics at the site, which included Acheulean traditions and MP lithic productions are similar to Paleolithic context known in northern Arabia. This could open a new window for further comparative studies and discussing the expansion of Palaeolithic groups in the region in general.

Classification studies of the lithics gathered from systematic survey revealed similarity of artefacts characteristics at the site from the Middle and Late



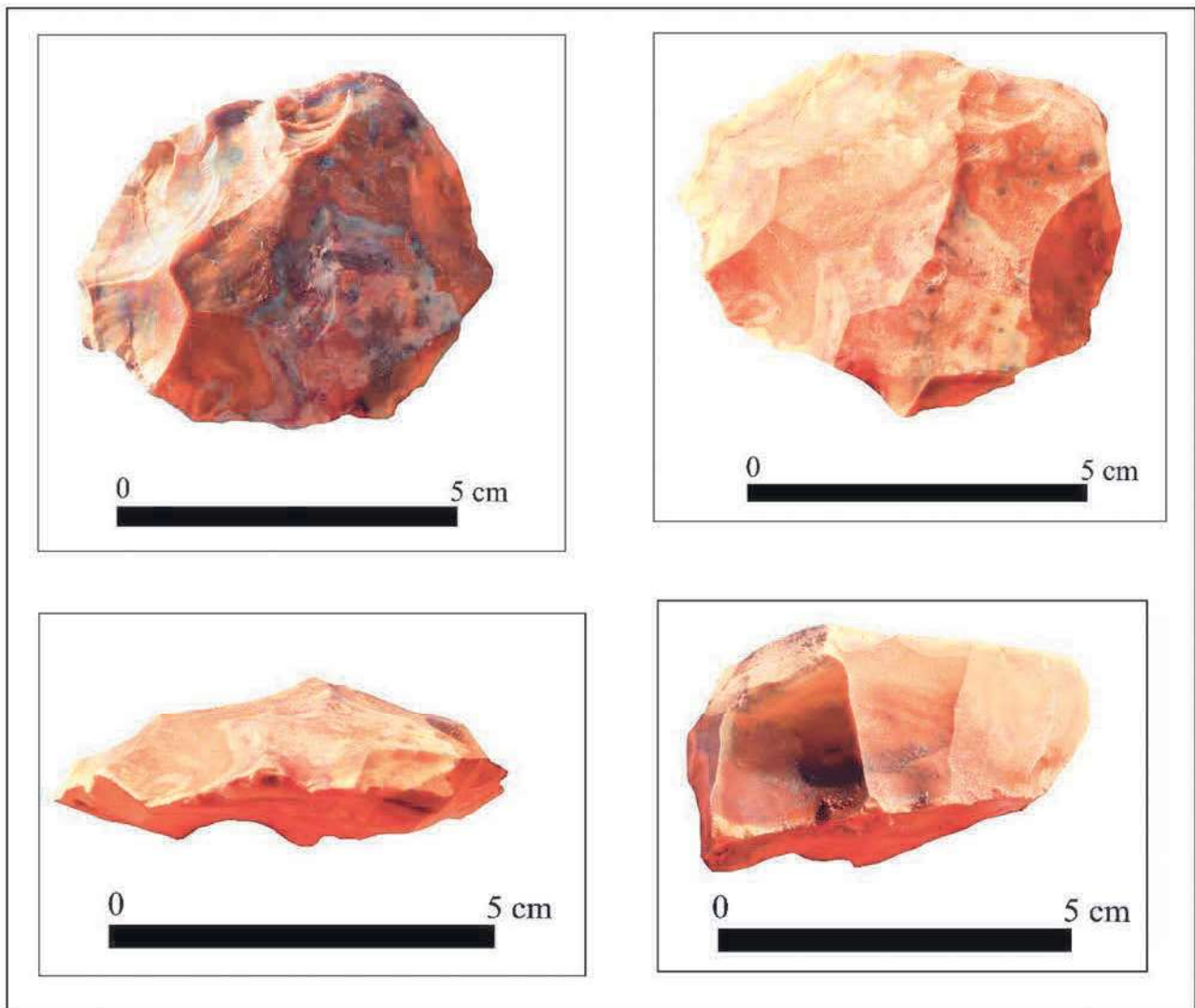


FIGURE 11: Middle Palaeolithic lithics from different angles.

Acheulean and Middle Palaeolithic periods, based on the presence of mode 2 Acheulean bifaces and mode 3 prepared Levallois productions. However, the site needs comprehensive research with excavation supported by laboratory dating.

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## REFERENCES

- ALASMARI K., 2019: *Neolithic Period, North-western Saudi Arabia*. PhD thesis, University of York.
- BAILEY G. N., DEVÈS M. H., INGLIS R. H., MEREDITH-WILLIAMS M. G., MOMBER G., SAKELLARIOU D., SINCLAIR A. G. M., ROUSAKIS G., AL GHAMDI S., and ALSHAREKH A. M., 2015: Blue Arabia: Palaeolithic and underwater survey in SW Saudi Arabia and the role of coasts in Pleistocene dispersals. *Quaternary International* 382: 42–57. <https://doi.org/10.1016/j.quaint.2015.01.002>
- BREEZE P. S., GROUCUTT H. S., DRAKE N. A., LOUYS J., SCERRI E. M., ARMITAGE S. J., ZALMOUT I. S., MEMESH A. M., HAPTARI M. A., SOUBHIS A., MATARI A. H., ZAHIR M., AL-OMARI A., ALSHAREKH A., PETRAGLIA M. D. 2017: Prehistory and palaeoenvironments of the western Nefud Desert, Saudi Arabia. *Archaeological Research in Asia* 10: 1–16. <https://doi.org/10.1016/j.ara.2017.02.002>
- CRASSARD R., PETRAGLIA M., 2014: Stone technology in Arabia. In: *Encyclopaedia of the history of science, technology, and medicine in non-western cultures*. Pp. 1–5. Springer, Dordrecht. [https://doi.org/10.1007/978-94-007-3934-5\\_10043-1](https://doi.org/10.1007/978-94-007-3934-5_10043-1)
- DEREVIANKO A. P., 2016: The Middle Paleolithic of Arabia. *Archaeology, Ethnology & Anthropology of Eurasia* 44,4: 3–25. <https://doi.org/10.17746/1563-0110.2016.44.4.003-025>
- GROUCUTT H. S., SHIPTON C., ALSHAREKH A., JENNINGS R., SCERRI E. M., PETRAGLIA M. D., 2014: Late Pleistocene lakeshore settlement in northern Arabia: Middle Palaeolithic technology from Jebel Katefeh, Jubbah. *Quaternary International* 30: 1e22. <https://doi.org/10.1016/j.quaint.2014.12.001>
- GROUCUTT H. S., SCERRI E. M., AMOR K., SHIPTON C., JENNINGS R. P., PARTON A., CLARK-BALZAN L., ALSHAREKH A., PETRAGLIA M. D., 2017: Middle Palaeolithic raw material procurement and early stage reduction at Jubbah, Saudi Arabia. *Archaeological Research in Asia* 9: 44–62. <https://doi.org/10.1016/j.ara.2017.01.003>
- GROUCUTT H. S., GRÜN R., ZALMOUT I. A., DRAKE N. A., ARMITAGE S. J., CANDY I., CLARK-WILSON R., LOUYS J., BREEZE P. S., DUVAL M., BUCK L. T., KIVELL T. L., POMMEROEY E., STEPHENS N. B., STOCK J. T., STEWART M., PRICE G. J., KINSLEY L., SUNG W., ALSHAREKH A., AL-OMARI A., ZAHIER M., MEMESH A. M., ABDULSHAKOOR A. J., AL-MASARI A. M., BAHAMEEM A., AL MURAYYI K. S., ZAHIRANI B., SCERRI E. M., PETRAGLIA M. D., 2018: Homo sapiens in Arabia by 85,000 years ago. *Nature ecology & evolution* 2, 5: 800–809. <https://doi.org/10.1038/s41559-018-0518-2>
- GROUCUTT H. S., WHITE T. S., SCERRI E. M., ANDRIEUX E., CLARK-WILSON R., BREEZE P. S., ARMITAGE S. J., STEWART M., DRAKE N., LOUYS J., PRICE G. J., DUVAL M., PARTON A., CANDY I., CARLETON W. C., SHIPTON C., JENNINGS R. P., ZAHIER M., BLINKHORN J., BLOCKLEY S., AL-OMARI A., ALSHAREKH A. M., PETRAGLIA M. D., 2021: Multiple hominin dispersals into Southwest Asia over the past 400,000 years. *Nature* 597: 376–380. <https://doi.org/10.1038/s41586-021-03863-y>
- GUAGNIN M., SHIPTON C., AL-RASHID M., MOUSSA F., EL-DOSSARY S., SLEIMAH M. B., ALSHAREKH A., PETRAGLIA M., 2017: An illustrated prehistory of the Jubbah oasis: Reconstructing Holocene occupation patterns in north western Saudi Arabia from rock art and inscriptions. *Arabian Archaeology and Epigraphy* 28, 2: 138–152. <https://doi.org/10.1111/aae.12089>
- HILBERT Y. H., CRASSARD R., 2020: Middle and Late Pleistocene lithic technology from the region of Dumat al-Jandal, northern Saudi Arabia. In: *Proceedings of the Seminar for Arabian Studies*. Vol. 50, Pp. 27–42. Archaeopress.
- HILBERT Y. H., WHITE T. S., PARTO, A., CLARK-BALZAN L., CRASSARD R., GROUCUTT H. S., JENNINGS R. P., BREEZE P., PARKER A., SHIPTON C., AL-OMARI A., ALSHAREKH A. M., PETRAGLIA M. D., 2014: Epipalaeolithic occupation and palaeoenvironments of the southern Nefud desert, Saudi Arabia, during the Terminal Pleistocene and Early Holocene. *Journal of Archaeological Science* 50: 460–474. <https://doi.org/10.1016/j.jas.2014.07.023>
- JENNINGS R. P., SINGARAYER J., STONE E. J., KREBS-KANZOW U., KHON V., NISANCIOGLU K. H., PFEIFFER M., ZHANG X., PARKER A., PARTON A., GROUCUTT H. S., WHITE T. S., DRAKE N. A., PETRAGLIA M. D., 2015: Multi-scale Acheulean landscape survey in the Arabian Desert. *Quaternary International* 382: 58–81. <https://doi.org/10.1016/j.quaint.2015.01.028>
- JENNINGS R. P., PARTON A., CLARK BALZAN L., WHITE T. S., GROUCUTT H. S., BREEZE P. S., PARKER A. G., DRAKE N. A., PETRAGLIA M. D., 2016: Human occupation of the northern Arabian interior during early Marine Isotope Stage 3. *Journal of Quaternary Science* 31, 8: 953–966. [doi.org/10.1002/jqs.2920](https://doi.org/10.1002/jqs.2920)
- MARKS A., 2023: Introduction: A Personal Trip into Arabian Prehistory: Past, Present and Future. *Paléorient. Revue pluridisciplinaire de préhistoire et de protohistoire de l'Asie du Sud-Ouest et de l'Asie centrale* 49, 1: 5–8. <https://doi.org/10.4000/paleorient.2858>
- NASSR A., ELHASSAN A., 2020: New discovery of Acheulean large cutting stone tools agglomeration in Faïd Depression south of Nefud Desert, Saudi Arabia. *Adumatu* 41: 7–16.
- NASSR A., AL-HAJJ M., TUEAIMAN A., ELHASSAN A., 2022: Reconnaissance a new Palaeolithic site at Al-Huwaidy in Ha'il region, northwest Saudi Arabia. *Journal of Lithic Studies* 9, 1: 1–14. DOI: <https://doi.org/10.2218/jls.6550>
- NASSR A., ALFRAIDI Y., ELHASSAN A., TUEAIMAN A., ABDELAZIM T., ALHAMLI F., 2025: Landscape of Lower and Middle Palaeolithic sites in Ha'il province, northern Saudi Arabia. *L'Anthropologie* 103346. <https://doi.org/10.1016/j.anthro.2024.103346>
- PARKER A. G., 2010: Pleistocene climate change in Arabia: developing a framework for hominin dispersal over the last 350 ka. In: M. D. Petraglia, J. I. Rose (Eds.): *The evolution of human populations in Arabia: palaeoenvironments, prehistory*



- and genetics. Pp. 39-49. Vertebrate Paleobiology and Paleonthropology. Springer, Dordrecht.  
[https://doi.org/10.1007/978-90-481-2719-1\\_3](https://doi.org/10.1007/978-90-481-2719-1_3)
- PETRAGLIA M. D., DRAKE N., ALSHAREKH A., 2010: Acheulean landscapes and large cutting tools assemblages in the Arabian Peninsula. In: M. D. Petraglia, J. I. Rose (Eds.): *The evolution of human populations in Arabia*. Pp. 103-116. Vertebrate Paleobiology and Paleonthropology. Springer, Dordrecht. doi.org/10.1007/978-90-481-2719-1\_8
- PETRAGLIA M. D., ALSHAREKH A., BREEZE P., CLARKSON C., CRASSARD R., DRAKE N. A., GROUCUTT H. S., JENNINGS R., PARKER A. G., PARTON A., ROBERTS R. G., SHIPTON C., MATHESON C., AL-OMARI A., VEALL M. A., 2012: Hominin dispersal into the Nefud desert and Middle Palaeolithic settlement along the Jubbah palaeolake, northern Arabia. *PLoS One* 7, 11: e49840.  
<https://doi.org/10.1371/journal.pone.0049840>
- PETRAGLIA M. D., BREEZE P. S., GROUCUTT H. S., 2019: Blue Arabia, Green Arabia: Examining Human Colonisation and Dispersal Models. In: N. Rasul, A. I. Stewart (Eds.): *Geological Setting, Palaeoenvironment and Archaeology of the Red Sea*. Pp. 675-683. Springer, Cham.  
[https://doi.org/10.1007/978-3-319-99408-6\\_30](https://doi.org/10.1007/978-3-319-99408-6_30)
- ROBERTS P., STEWART M., ALAGAILI A. N., BREEZE P., CANDY I., DRAKE N., GROUCUTT H. S., SCERRI E. M. L., LEE-THORP J., LOUYS J., ZALMOUT I. S., AL-MUFARREH Y. S. A., ZECH J., ALSHAREKH A. M., AL-OMARI A., BOIVIN N., PETRAGLIA M., 2018: Fossil herbivore stable isotopes reveal middle Pleistocene hominin palaeoenvironment in 'Green Arabia'. *Nature ecology and evolution* 2,12: 1871-1878.  
<https://doi.org/10.1038/s41559-018-0698-9>
- SADIG A., ALASMARI K., 2022: The State of the Palaeolithic Archaeological Research in Saudi Arabia. An Evaluation Study (Arabic version). *Al Qulzum Journal for archeological and tourism studies* 25-48.
- SCERRI E. M., BREEZE P. S., PARTON A., GROUCUTT H. S., WHITE T. S., STIMPSON C., CLARK-BALZAN L., JENNINGS R., ALSHAREKH A., PETRAGLIA M. D., 2015: Middle to Late Pleistocene human habitation in the western Nefud desert, Saudi Arabia. *Quaternary International* 382: 200-214. <https://doi.org/10.1016/j.quaint.2014.09.036>
- SCERRI E. M., SHIPTON C., CLARK-BALZAN L., FROUIN M., SCHWENNINGER J. L., GROUCUTT H. S., BREEZE P. S., PARTON A., BLINKHORN J., DRAKE N. A., JENNINGS R., CUTHBERTSON P., AL-OMARI A., ALSHAREKH A., PETRAGLIA M. D., 2018: The expansion of later Acheulean hominins into the Arabian Peninsula. *Scientific Reports* 8, 1: 1-9.  
<https://doi.org/10.1038/s41598-018-35242-5>
- SCERRI E. M., FROUIN M., BREEZE P. S., ARMITAGE S. J., CANDY I., GROUCUTT H. S., DRAKE N., PARTON A., WHITE T. S., ALSHAREKH A. M., PETRAGLIA M. D., 2021: The expansion of Acheulean hominins into the Nefud Desert of Arabia. *Scientific reports* 11, 1: 1-10.  
<https://doi.org/10.1038/s41598-021-89489-6>
- SHIPTON C., BLINKHORN J., BREEZE P. S., CUTHBERTSON P., DRAKE N., GROUCUTT H. S., JENNINGS R. P., PARTON A., SCERRI E. M., ALSHAREKH A., PETRAGLIA M. D., 2018: Acheulean technology and landscape use at Dawadmi, central Arabia. *PloS one* 13, 7: e0200497.  
[doi.org/10.1371/journal.pone.0203488](https://doi.org/10.1371/journal.pone.0203488)
- STEWART M., CLARK-WILSON R., BREEZE P. S., JANULIS K., CANDY I., ARMITAGE S. J., RYVES D. B., LOUYS J., DUVAL M., PRICE G. J., CUTHBERTSON P., BERNAL M. A., DRAKE N. A., ALSHAREKH A. M., ZAHRANI B., AL-OMARI A., ROBERTS P., GROUCUTT H. S., PETRAGLIA M. D., 2020: Human footprints provide snapshot of last interglacial ecology in the Arabian interior. *Science advances* 6, 38: eaba8940.  
<https://doi.org/10.1126/sciadv.aba8940>

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