

Investigation of Paleolithic Localities in the Faïd Area of Ha'il in Northwest Saudi Arabia

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Abstract

The ongoing archaeological survey and excavations in the Faïd area in northwest Saudi Arabia has uncovered remains of a large early Islamic settlement. Paleolithic artefacts discovered in the building foundations of that settlement during the 2019 excavation showed that a Paleolithic site was buried partially by the settlement ruins. An archaeological exploration was carried out in the area around the site in March 2020 that documented three Paleolithic sites (Faïd 1 – Faïd 3). In February 2021, the archaeological survey was extended to the east and west of the settlement, resulting in the discovery of four additional Paleolithic sites (Faïd 4 – Faïd 7). The archaeological sites represented two main Paleolithic traditions: Acheulean, identified from the presence of bifaces, and Middle Palaeolithic, represented by production of prepared cores and points referable to the Levallois method. Faïd 2 is an Acheulean site, where a systematic survey shows agglomeration of large cutting tools (LCTs) covering an area of 15 hectares. Handaxes and cleavers are the most conspicuous artefacts. Thus, the locations of these archaeological sites and lithic technocomplexes have direct relevance in assessing hominin dispersal routes through Arabia to the rest of Eurasia.

Keywords: Arabia, handaxes, lithics, Acheulean, Middle Palaeolithic.

Introduction

Arabia is located on the routes of early hominin dispersal from Africa to Eurasia. Recent studies document multiple migrations and several dispersal routes across Arabia (Groucutt et al., 2021). Although many Paleolithic sites are reported in Arabia and the general outlines of Arabian prehistory are known, several geographical regions remain unstudied. Ongoing research on *palaeodeserts* and *dispersal* from 2010 to 2022 indicate that Arabia was not

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only a bridge on hominin routes to Asia but that it was also occupied on and off for millennia (Groucutt, 2020; Groucutt et al., 2021., Petraglia, Drake and Alsharekh, 2010; Roberts et al., 2018). Stratified Paleolithic sites have been excavated and lithics, fossils, sedimentary deposits, and footprints have been found along the margins of Middle and Late Pleistocene lakes (Petraglia, Breeze, and Groucutt, 2019; Scerri et al., 2021; Scerri et al., 2018; Stewart et al., 2020).

In northern Saudi Arabia, comprehensive surveys of the Jubbah basin revealed extensive Acheulean and Middle Paleolithic sites around the edges of a paleo-oasis (Crassard and Petraglia, 2014), and a recent survey conducted in the region of Ha'il discovered Acheulean artefacts in Al-Huwaydy village, located about 70 km southwest of Ha'il (Nassr et al., 2022). The Acheulean stone tools found in the site of KF-8 in Jubbah are characterised by the presence of typical handaxes, whereas the Middle Paleolithic tools are distinguished by the presence of Levallois preferential core preparation and points discovered from site JSM-1. Additionally, research conducted on many Middle Paleolithic sites showed that hominins used a variety of raw material sources to produce Levallois stone tools (Groucutt et al., 2017). On the other hand, the setting and lithic concentrations of Middle Paleolithic sites are indicative of episodic and short periods of occupation, such as seasonal camps.

This research focuses on the Faid area in the region of Ha'il, located in northwestern Saudi Arabia in terrain consisting of rocky foothills, water channels, flat plains, and sand dunes. Here we present new archaeological discoveries in Faid, emphasising Paleolithic site distributions in the area and the Paleolithic artefacts recovered from the site of Faid 2.

The aim of our research is to present the principal characteristics of Lower and Middle Paleolithic archaeology from the region located between the two main clusters of Paleolithic sites in northwestern Saudi Arabia: (a) the desert (*Nefud*), a landscape with traces of paleo-hydrological water systems and ancient rivers covered by sand, and b) rocky volcanic fields (*harrat*), extensive lava outcrops and volcanic mountains cut by narrow paleo-channels and oases. For the topography of the Faid area, the hypothesis raised by Breeze and colleagues (2016) is applicable. They proposed that Paleolithic groups occupied the volcanic fields close to ancient rivers in order to exploit volcanic raw material for lithic production (Breeze et al., 2016). Recent work in Faid sheds new light on human adaptation in northwest Arabia and allows for comparison of early human migrations out of Arabia into the Levant.

Aims and Methods

One of the chief debates in Arabian Paleolithic archaeology concerns the nature of paleo-landscapes in different places and moments in time, distinguishing surface sites from background lithic scatter, and differences between relatively 'fresh' stratified artefacts and eroded and weathered surface material. These questions are related to the discussion of Pleistocene environmental change in Arabia (Groucutt, Scerri, Stringer and Petraglia, 2019; Scerri et al., 2021). Extensive hominin occupation and large-scale migrations are documented during the middle and late Pleistocene (Breeze et al., 2016). Several migration routes have been proposed that link northern Arabia to the Levant and Mesopotamia (Groucutt et al., 2021). These proposals remain untested, and there are many areas that remain untouched by archaeological survey and large-scale excavation (Stewart et al., 2020).

In the Nefud desert and along the coast of the Red Sea, Paleolithic sites are buried in the Pleistocene deposits and covered by sand dunes. In the central and northern part of Saudi Arabia, Paleolithic sites tend to be found in rocky volcanic fields (*harrat*). The above hypotheses of Paleolithic occupation and the unique landscape of the Faid area encourage our research into the Paleolithic of the region.

As noted above, the Faïd landscape consists of a lava field (*harrat*), paleo-hydrological sources from an oasis and a plateau on the edge of the volcanic field drained by many ancient rivers. The lava field covers much of the area, punctuated by volcanic hills and cut by deeply incised channels as the chief topographical features. Our methodology is based on previous archaeological experience in northwestern Arabia, where literature-based research documenting important landscape features replete with natural resources has guided many earlier archaeological projects (see Kennedy, 2011).

Google Earth and desktop archaeology were employed to select target areas for ground survey, whereas the margin of the paleo-water system and the foot of the rocky volcanic field are the favoured topography to locate Paleolithic sites based on the previous results of many previous studies (e.g., The Paleodeserts Project [Breeze et al., 2015]). A judgmental sampling strategy was adopted focusing on gentle outcrops and the *harrat* on the margins of the depression and the paleo-oasis, and on wadi banks downcut through the alluvial plain. Archaeological sites were recorded according to the concentration of lithics on the surface. Our definition of an archaeological site was primarily based on site landscape criteria and on whether 20 or more artefacts were collected within an area of 100 m².

Isolated single artefacts (background scatter [e.g., Clark, 2016: 459-461]) were not recorded as archaeological sites. Lithics are documented in the field and not collected except at Faïd 2, as a case study of Paleolithic archaeology, and ten diagnostic Middle Paleolithic stone tools were collected from the site of Faïd 3. In considering the weathered condition of the lithics from the site surfaces, our criteria to identify stone tools included the number and size of flaking scars and striking platform type (Crassard and Petraglia, 2014; Rose 2022), and the general morphology of the dorsal and ventral surfaces, flake and striking platform angles, edge characteristics, and shape in plan view.

Lithics were collected from the site of Faïd 2 as a case study using a random sampling design and classified by conventional technological and typological systematics (Bordes, 1961). Locations of individual pieces were plotted using a total station in a 100 m² unit. A second sample was collected for further research from a 25 m² surface and from a 1 m² sondage. An Acheulean (Mode 2) component was identified by the presence of bifaces, and a Middle Paleolithic (Mode 3) component by the presence of Levallois technology productions. Numbers of flake scars, platform types, blank sizes, and edge shapes were recorded and compared with other Arabian Mode 2 and 3 assemblages.

Archaeological Survey

The region of Ha'il is located on the margin of the Nefud desert belt in northwestern Saudi Arabia. It consists of volcanic rocky foothills, basalt field (*harrat*), deep water channels, flat plains, and sand dunes. The Faïd archaeological site consists of ruins of an early Islamic settlement (Faïd historical city), including domestic buildings, palace, mosques, wells, water-reservoirs, and fortification walls that lie on the volcanic outcrops. Since 2014, archaeological fieldwork shifted to the University of Ha'il, where a single handaxe was found in the building remains. This was the first indicator that eventually led to the discovery of Acheulean bifaces in the east of the city, namely Faïd 2 (Nassr and Elhassan, 2020). In March 2020 and February 2021, systematic archaeological survey and test excavations carried out by the authors revealed that the historical Faïd city was established on Paleolithic habitation remains (Faïd 1).

The survey briefly investigated the depression east of historical Faïd, following the channel margins up to a distance of 10 kms, in order to evaluate its potential for a long-

term study of Paleolithic archaeology. In addition, a preliminary exploration was carried out on the foot of the volcanic field west of Faïd and the rocky mounds north of it. Seven sites were discovered (Figure 1). Faïd 1 is a buried Paleolithic site where large flakes and bifaces were found beneath the ruins, some of them used as building materials. This prompted us to carry out a survey along the volcanic field on the edge of the depression. Faïd 2 was discovered about 600 m east of Faïd 1. Faïd 2 is the best-preserved Paleolithic locality in the area.

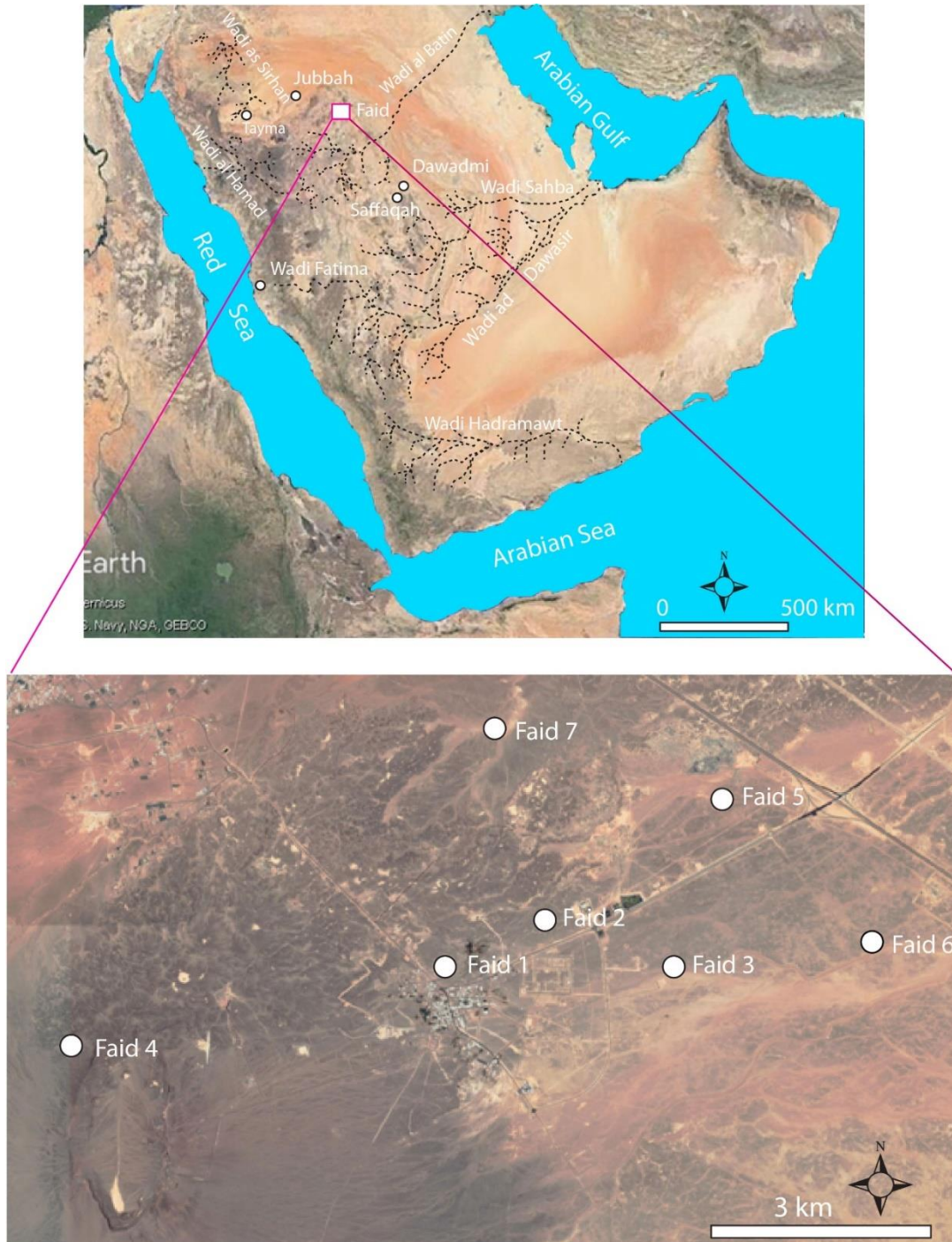


Figure 1. Map of Paleolithic sites in the vicinity of the modern city of Faïd.

Our survey also explored the area north and west up to 10–15 km from Faid 1 and up to 20 kms to the east following the banks of the ancient rivers that drained the plateau (Figure 1). Based on the presence of weathered large cutting tools (LCTs), including bifaces (handaxes) and cleavers, Faid 4, 5 and 7 presented characteristics similar to Faid 1 and Faid 2 (Table 1). All five sites were assigned to the Acheulean technocomplex (Figure 2).



Figure 2. Weathered typical bifaces from the site of Faid 2.

Table 1: Palaeolithic sites discovered by archaeological survey in the Faïd area.

Site ID	Archaeological Methods	Size (hectares)	Lithics distribution	Habitation pattern	Proposed date
Faid 1	Survey (Lithics not collected)	15	More than 40 artefacts in a 100 m ² area.	Occupation and workshop	Lower Palaeolithic
Faid 2	Survey and excavation (202 Lithics collected)	20	More than 80 artefacts in a 100 m ² area.	Occupation and workshop	Lower Palaeolithic
Faid 3	Survey (10 Lithics collected)	40	More than 35 artefacts in a 100 m ² area.	Occupation	Middle Palaeolithic
Faid 4	Survey (Lithics not collected)	30	More than 30 artefacts in a 100 m ² area.	Occupation and workshop	Lower Palaeolithic
Faid 5	Survey (Lithics not collected)	15	More than 25 artefacts in a 100 m ² area.	Occupation	Lower Palaeolithic
Faid 6	Survey (Lithics not collected)	16	More than 30 artefacts in a 100 m ² area.	Occupation	Middle Palaeolithic
Faid 7	Survey (Lithics not collected)	12	More than 25 artefacts in a 100 m ² area.	Workshop	Lower Palaeolithic

The Middle Paleolithic (Mousterian) was identified at the site of Faïd 3 in the eastern part of the survey area, associated with flat alluvial mounds overlooking the fossil river channels that drained the eastern plateau. Weathered Levallois point and flake cores and points were the diagnostic pieces recovered from the site surface (Figure 3). The artefacts were scattered over about 40 hectares, with multiple discrete clusters of denser concentrations. Our sampling strategy focused on these lithic concentrations and their technological characteristics. The assemblage was dominated by Levallois cores, Levallois points, and Mousterian points. Lithic technology and the diagnostics point to a large, mostly Middle Paleolithic palimpsest, or depositional composite (Clark, 2017: 351-352). The same materials were also recovered at the site of Faïd 6.

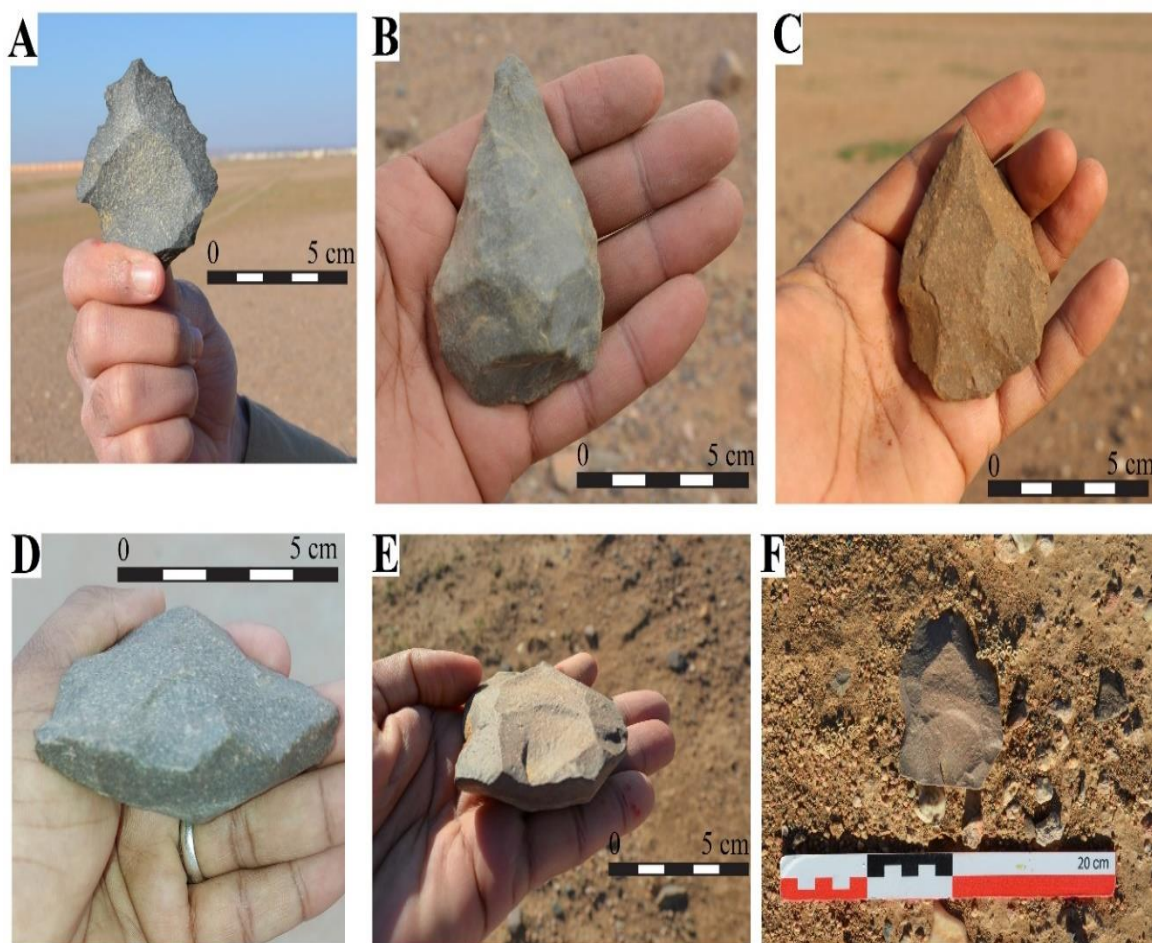


Figure 3. Middle Paleolithic artefacts from the site of Faid 3 (A: Levallois point made from basalt, B: Bifacial leaf point made from chert, C: Prepared Levallois point made from chert, D-E: Different angles of prepared Levallois points, F: Levallois point laying on the site surface).

Paleolithic Archaeology at Faid (the case of the Faid 2 site)

The Paleolithic site of the Faid 2 lay on the linear outcrops of weathered andesite volcanic rocks. These outcrops of andesite dykes show traces of knapped boulders, and the density of Acheulean flakes and cores present direct evidence of quarrying of volcanic outcrops. The southern part of the site is buried by the huge buildings of Faid historical city (Figure 4).



Figure 4. General view of the Faid 2 archaeological site. A: Faid 1, where the Paleolithic occupation was buried by Faid historical city ruins, B: Faid 2, clusters of LCTs on the surface of the northern part of the site.

The floor of the Faid depression is mostly flat and is covered by sand and weathered quartz gravels and basalt rocks. The channel sections consist of fluvial deposits overlain by slope wash and overbank sediments containing large cobbles and boulders. Bifaces have been recovered from these sections (Figure 5). The site is situated on volcanic outcrops (*harrat*) close to the margin of the depression. The eastern part of the site shows small mounds of sediments on the banks of tributary channels covered by gravels and pebbles as well as the presence of several concentrations of bifaces, Acheulean flakes and Levallois cores.

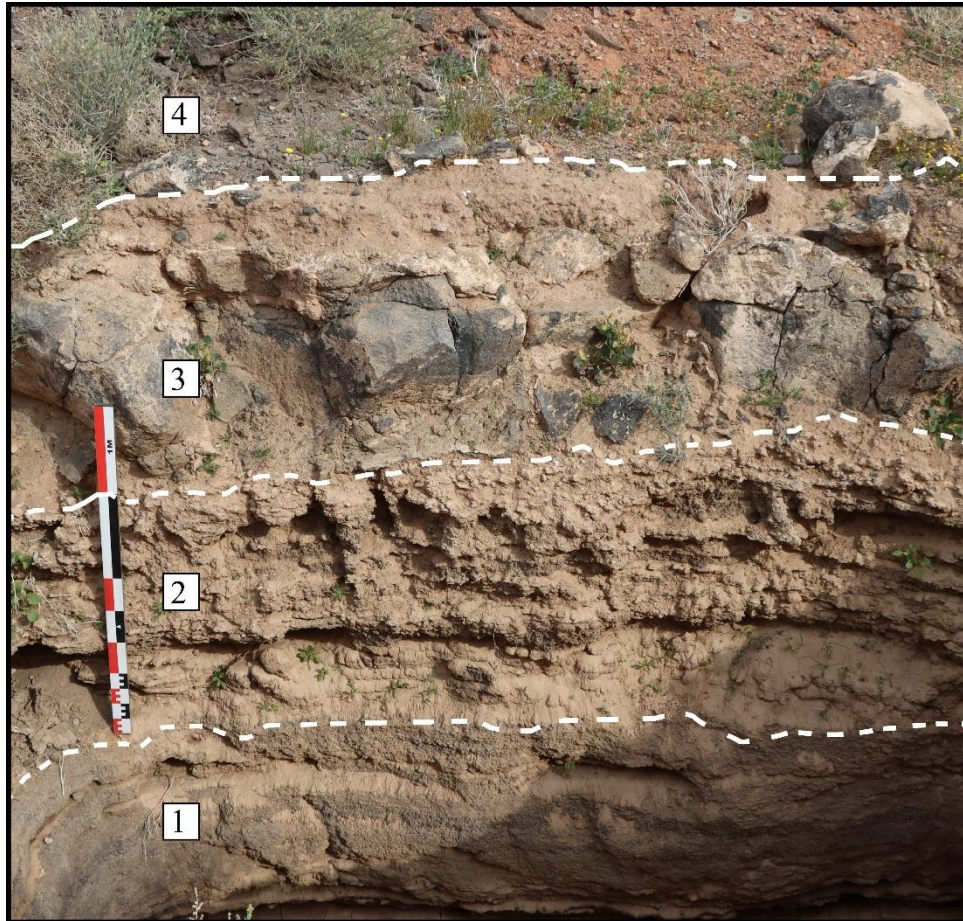


Figure 5. A stratigraphic profile of Faïd 2 from a well shaft where bifaces were embedded in the upper horizons of the section. Legend: (4) weathered layer consisting of clay, gravel, and sand, rich in Paleolithic artefacts, (3) the main layer of Paleolithic occupation occur in fine sediments with andesite cobble inclusions and artefacts embedded in compact sediments. (2) reddish loam matrix of consolidated palaeosol, (1) loose blocks derived from fine consolidated volcanic lava bedrock.

Lithic Assemblages

Faïd 2 is an open-air site distinguished by the presence of LCTs on the surface with traces of knapping on large andesite cobbles, suggesting that the LCTs were locally made (Figure 6). Bifaces were also found along the depression as far as 3-4 km north of the site. Handaxes, cleavers, cores, large flakes, and waste covered the archaeological site surface. Lithics were observed in dense accumulations and in multiple discrete scatters.



Figure 6. Weathered Acheulean lithics accumulated on the surface of the Faid 2 site.

A 10 x 10 m square was collected in the middle of the site that yielded 167 pieces plotted with a total station, about 78 pieces identified as artefacts based on the presence of bulbs of percussion, striking platforms, and flake scars. Shaped tools included handaxes, cleavers, Acheulean cores, and flakes, along with a few Middle Paleolithic artefacts (Figure 7). A second 5 x 5 m square was collected, and one 1 x 1 m test excavation revealed bifaces beneath 30–40 cm of sediments above the reddish loam palaeosol.

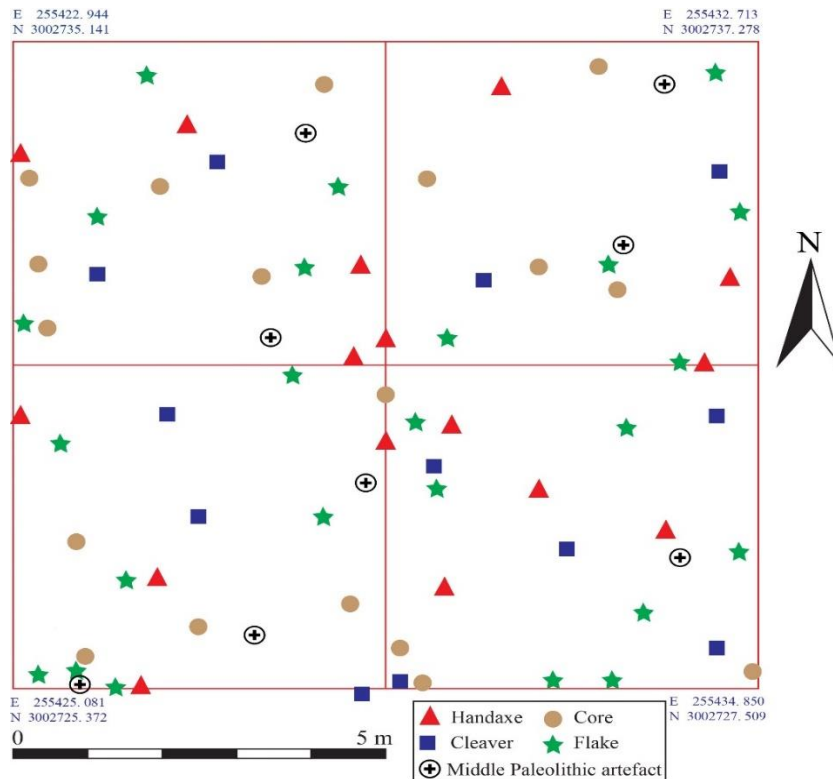


Figure 7. Lithic distributions of 10x10 meters of the Faid 2 site.

Stone Artefacts Characteristics

Overall, the lithics collected totalled 202 artefacts (retouched pieces [tools], cores and flakes), out of which 124 were sampled randomly, 72 were collected by surface cleaning, and six were obtained from test excavation. The preferred raw material was andesite, although a few were made from quartz, chert, and basalt. Two andesite handaxes from the test excavation were patinated.

The assemblage was dominated by large bifaces of Acheulean tradition (95%) (Figure 8). Cores showed long flakes struck from plain and cortical platforms. Negatives of detachments on otherwise unmodified boulders shed light on understanding LCTs technology. Additionally, many traces of hard hammer percussion were recognised on what appear to be hammer stones.



Figure. 8: Weathered Acheulean LCTs from the site Faid 2.

There is evidence of the detachment of large flakes from the edges of cores to produce the handaxes and cleavers. Flakes were removed from both sides of a core by rapping it against an andesite anvil or by using a hard hammer stone to form a sinuous cutting edge all around it. In some cases of typical handaxes, the whole surface of the core was flaked away to form an oval implement with relatively straight edges and a pointed end. Small flakes were sometimes removed from the edges to further straighten them. The scar stages of Acheulean flaking were mainly observed on the dorsal surface of the piece. The ventral surface was produced by the detachment of one large flake from the nucleus and was not subsequently retouched.

The dimensions of large Acheulean flakes range between 7-18 cm (length, as measured along the axis of symmetry) and 5-7 cm (width, measured at the midpoint perpendicular to the axis of symmetry). The typical handaxes show continuous retouch along both edges, are most often convex in plan, and with pointed tips. Thirty percent of the large bifaces are

made on flakes with cortical striking platforms. The typical and foliate handaxes show flake scars over the entire dorsal from different directions. Cortex is limited to 10%. The shape in plan view is mainly lanceolate; a few of the bifaces are oval with curved cutting edges (Table 2).

Table 2. Classification summary of the 202 lithics collected from the Faïd 2 Palaeolithic site.

Tool Type	Number	Raw Material	Blank Type	Size (cm) Max	Scars count Face 1 (Dor)-Max	Scars count Face 2 (Ven)-Max	Form Shape	Platform Type	Cortex Max
Large-size handaxes	13	Andesite	6 Flake 7 Clast	28.3 x 15.5 x 7.2	5	3	5 Cordiform 8 Lanceolate	4 Facetted 9 Cortical	30%
Typical handaxes	22	20 Andesite 2 Cherts	Flake	20.6 x 12.7 x 5.2	10	7	4 Cordiform 12 Lanceolate 6 Ovate	17 Facetted 5 Cortical	10%
Foliate handaxes	27	Andesite	Flake	12.5 x 9.8 x 5.8	8	4	Lanceolate	24 Facetted 3 Cortical	10%
Cleaver	26	Andesite	21 Flake 5 Clast	19.4 x 9.2 x 4.8	6	1	21 Cordiform 5 Ovate	15 Facetted 11 Cortical	30%
Disc	7	Andesite	Flake	13.3 x 12.3 x 4.9	7	6	Tear-Drop	Facetted	10%
Acheulean Core	24	Andesite	16 Flake 8 Clast	10 x 8.8 x 2.6	3	1	Tear-Drop	Cortical	30%
Acheulean flake	27	25 Andesite 2 Cherts	Flake	30 x 20 x 10	3	2	Tear-Drop	16 Facetted 8 Cortical	50%
Hammer	6	Andesite	Clast	11.4 x 11.4 x 7.5	6	4	Tear-Drop	Cortical	30%
Other LCTs	26	24 Andesite 2 Cherts	21 Flake 5 Clast	12.9 x 11.4 x 6.4	6	1	Ovate	Facetted	10%
Levallois core/ point	24	16 Andesite 9 Basalt	Flake	11.8 x 10.3 x 7.5	8	8	Tear-Drop/ Lanceolate	17 Facetted 7 Cortical	20%

Flake scars were counted on each LCT type. Large cleavers and handaxes presented 4-7 flake scars on the dorsal surface. Typical handaxes, foliate handaxes, and points had >10 flake scars on each face.

The main lithic categories are Mode 2 (Acheulean) including handaxes, cleavers, and points. Other types are rare with Levallois cores and points (Mode 3) accounting for only 5%. Handaxes made on large flakes are dominant with lanceolate, foliate, triangular, and oval plan views. Middle Paleolithic artefacts are rare at Faïd 2, whereas they are dominant in the collection from Faïd 3.

Discussion

The Faïd archaeological survey adds seven new Paleolithic sites in northwestern Arabia, with dense scatters of Lower and Middle Paleolithic artefacts associated with a paleo-oasis at the foot of a basaltic lava field with andesite outcrops that provided raw material for Acheulean and Middle Paleolithic hominins over tens of thousands of years, underscoring the importance of Pleistocene landscape archaeology in this part of Saudi Arabia. Insofar as it is known (and it is poorly known at present), the paleo-landscape suggests that these sites might be penecontemporaneous with an episode, or a series of episodes marked by increased precipitation, spring (re)activation, ancient rivers and possibly even lakes. Work in southeastern Jordan also indicates a sustained presence of hominins during the late Middle and early Upper Pleistocene (e.g., Abed et al., 2000; Al-Nahar and Clark (2009). Quintero, Wilke, Rollefson., 2004; Rollefson et al., 2006; Rollefson, 2019; Whallon et al., 2001). In any event, the site setting and lithics distribution indicate long-term, although certainly episodic, use of the area, possibly for its abundance of lithic raw material (andesite) that occurs as cobbles among andesite outcrops. Acheulean sites are mainly recorded at the foot of the rocky volcanic field. Middle Paleolithic sites are commonly recorded in the flat areas on the fringe of the paleo-water channels. As elsewhere in Arabia, Acheulean lithics are dominated by handaxes and cleavers (Scerri et al., 2021; Shipton et al., 2018). Middle Paleolithic artefacts are identified on the basis of Levallois technology. Acheulean stone artefacts are usually made on locally abundant weathered andesite, which is hard and forms a sharp cutting edge. Middle Paleolithic artefacts are made on a range of rock types – chert, quartz, and rhyolite – also present, albeit less common, in the area. The Acheulean raw material types are andesite and basalt are broadly similar to that of southeastern Jordan and central Arabia (Quintero, Wilke, Rollefson, 2004; Rolston, 1984; Rollefson et al., 2006; Rollefson, 2019; Shipton et al., 2018; Whallon et al., 2001.); the Middle Paleolithic raw material types resembles those in Jubbah basin (Groucutt et al., 2017).

Survey and excavation of Faïd 2 showed that the dense concentration of cores, flakes, and tools is indicative of primary reduction of cores and the production of LCTs, producing quantities of unretouched flakes. Future excavations offer the possibility of finding stratified materials for the absolute dating of the sediment or bones. On the basis of our preliminary classification of artefacts from Faïd 2 (Table 2), the Acheulean (Mode 2) is best represented there. There is some Levallois production at Faïd 2 but the main Middle Paleolithic site is Faïd 3 (Mode 3).

Studies of Acheulean expansions in Arabia and Jordan illustrate a possible ‘corridor’ of Acheulean migration into and out of Arabia from two localities in the Dawadmi area and the Nefud desert in southern Arabia (Quintero, Wilke, Rollefson, 2004; Rollefson et al.,

2006; Rollefson, 2019; Scerri et al., 2018, 2021). The Acheulean occupations in the Dawadmi, represented by the Saffaqah sites, are associated with a volcanic dyke on the bank of an old depression, and the lithic scatter is also dominated by handaxes and cleavers. However, the Acheulean of the Nefud, represented by An Nasim, is mostly found on the margin of a paleo-oasis where the lithic assemblage is characterised by typical biface forms, no cleavers nor large flakes, and the handaxes are pointed with sharp edges and fine continuous flaking. The Acheulean at Faid more closely resembles the Acheulean of the Paleolithic Dawadmi area and the Wadi Fatima on the Red Sea coast (Groucutt et al., 2019; Shipton et al., 2018) more closely than that of the northern Nefud desert. Location on the dyke outcrops, the prevalence of large flakes and the LCT forms are the common features of the two areas.

In conclusion, we suggest that the location of the new Paleolithic sites discovered at Faid show a further extension of the Middle and Late Acheulean toward the northwest. Based on lithic techno-typology and the recent dating of sediments in northern Saudi Arabia, the relative age of the Faid Acheulean is Middle to Late Acheulean (Petraglia, Breeze, and Groucutt, 2019). The presence of Levallois cores and points, and the Mousterian point at Faid 3 indicates a second extension of Middle Paleolithic groups across the Ha'il region, towards the northwest. These propositions will be tested in the next field season through excavations and absolute dating of the Faid sites. Once dated, and when the paleogeography of the western 'corridor' becomes known in sufficient detail, they should be able to shed light on possible links between Arabia and the Levant (Breeze et al., 2016).

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اكتشاف مواقع أثرية للعصر الحجري القديم في منطقة فيد بحائل شمال غرب المملكة العربية السعودية

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ملخص

كشفت المسوحات والتنقيبات الأثرية المستمرة في منطقة فيد بشمال غرب المملكة العربية السعودية عن بقايا مدينة إسلامية كبيرة الحجم؛ حيث بيّنت الأدوات الحجرية التي وجدت أسفل ركام المباني خلال موسم 2019م موقعاً أثرياً للعصر الحجري القديم، عُطيت أجزاء كبيرة منه بركام مباني المدينة، وقد أجريت في ضوء ذلك مسوحات أثرية واستطلاعية حول المنطقة في مارس 2020م، نتج عنها تسجيل ثلاثة مواقع أثرية للعصر الحجري القديم (فيد 1 - فيد 3)، وفي فبراير 2021م توسع المسح الأثري شرقاً وغرباً وكشف عن أربعة مواقع أثرية أخرى للعصر الحجري القديم (فيد 4 - فيد 7). كشفت تلك المواقع الأثرية عن ثقافتين للعصر الحجري القديم بالمنطقة؛ التقاليد الأشولية متمثلة في ظهور الأدوات الحجرية ذات الوجهين، وتقاليد العصر الحجري القديم الأوسط متمثلة في إنتاج النوى المجهزة والرماح الليفلوازية. علماً أن فيد 2 موقع أشولي؛ حيث كشفت عمليات المسح الأثري القياسي فيه عن تراكم هائل للأدوات الحجرية الكبيرة؛ ما يُعرف بصناعة الشظايا الأشولية العريضة والقاطعة، التي وجدت منتشرة في مساحة 15 هكتاراً، وقد كانت الفؤوس اليدوية والسواطير الأكثر ظهوراً في تلك المجموعات الحجرية. وعليه، فإن طبيعة المواقع الأثرية ومميزات الأدوات الحجرية التقنية والنوعية فيها تُعد دليلاً مباشراً على تقييم طرق هجرة المجموعات البشرية المبكرة عبر الجزيرة العربية إلى أوروبا وآسيا.

الكلمات الدالة: الجزيرة العربية، الفأس اليدوية، الصناعات الحجرية، الأشولي، العصر الحجري القديم الأوسط.

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