A new Discovery of Acheulean Large Cutting Stone Tools Agglomeration in Faid Depression South of Nefud Desert, Saudi Arabia.

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Abstract: *The pioneer research of archaeology in the northern frontiers of Saudi Arabia revealed that the area of Nefud Desert and beyond is one of the homelands of Prehistoric cultures in Arabia. Since 2014, the University of Ha'il conducted an archaeological fieldwork at Faid area south of Nefud Desert, about 110 km southeast of Ha'il city. In early 2019, season 6, the staff of the Department of Tourism and Archaeology of the University of Hail carried out an archaeological survey and some excavations at the site of Faid. The exploration conducted led to the discovery of a Paleo-depression and an interesting Paleolithic site, about 600 meters east of the main site. The site contains a high agglomeration of large cutting stone tools on the surface of volcanic outcrops on the margin of the Paleo-channel. The preliminary systematic survey of stone artifacts distribution and classification of the samples show that the stone artifact technology and typology are bifacial large Acheulean cutting tools. The site setting and artifact characteristics are reminiscent to Acheulean sites of Dawadmi and Nefud in Saudi Arabia. Thus, this paper aims to shed light on this recent discovery of the Acheulean site at Faid and its contribution to the understanding of the prehistory in Arabia.*

Keywords: *Acheulean, Large cutting tools, Faid, Handaxes, Pleistocene.*

Introduction

The Arabian Desert in Saudi Arabia is regarded as one of the core areas for investigating the hominin dispersals from Africa. The research has revealed that the northern parts of the Arabia are the pivotal area of hominin presence in Pleistocene time (Whalen et al 1983; Petraglia 2003; Alsharekh 2006; Groucutt et al 2018; Shipton et al 2018). In addition, the location of the Arabian Desert between East Africa and their dispersal out of Africa makes the region a key corridor to study hominin dispersal into Eurasia (Petraglia et al 2010; Jenniags et al 2015; Groucutt et al 2017; Scerri et al 2018).

The systematic research of the Nefud Desert and beyond in the northern part of Saudi Arabia has shown many places of Paleolithic occupation. The recent discoveries of Acheulean sites in the Eastern Desert (Masojć et al 2019) and the Red Sea Coast (Beyin et al 2019) of Sudan indicate a complexity of the dispersal routes out of north-east Africa.

Looking at the current map of Paleolithic sites and finds in Arabia, would clearly suggest that the area of Saudi Arabia had been a long-term habitation region of Paleolithic groups (Acheulean and Middle Stone Age (Petraglia et al 2012). The Late Acheulean and Middle Paleolithic expansion and development have been evaluated with a multidisciplinary research (Scerri et al 2018). Large cutting stone tools (LCT) are the dominant indicators of the Lower Paleolithic at many sites such as Dawadmi, Shawayhitiyah, Wadi Fatima and across the Nefud Desert (Whalen et al 1988; Petraglia

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2003; Shipton et al 2014; Shipton et al 2018). Lower Paleolithic sites are rarely compared with younger contexts such as Late Acheulean, while Middle Paleolithic sites have been found in numerous clusters along the Red Sea, central Saudi Arabia and in the northern frontier of the Nefud Desert (Petraglia et al 2011; Groucutt et al 2017; Scerri et al 2018).

The main Acheulean cluster has been identified along Wadi Fatima near the Red Sea (Whalen et al 1988) and along the hilltops close to the town of Dawadmi in the central Saudi Arabia (Shipton et al 2018). The number of the sites recorded shows high intensity of Paleolithic occupations in both regions. Sites are very rich in Acheulean handaxes and large flakes. Open-air sites indicate that the Acheulean tool-makers inhabited volcanic hilltops and established small camps on the bank of wide Pleistocene channels near the outcrops of volcanic rocks, rhyolite and quartz (Petraglia et al 2011, Jennings et al 2015).

The recent discovery of buried Acheulean and Middle Stone Age sites across the Nefud Desert shed more light of Saudi Arabia's importance on early human dispersal into Eurasia (Alsharekh 2006; Scerri et al 2015; Groucutt et al 2018). Research combining investigations of the sites landscape, paleo-geology and paleo-environment revealed that Pleistocene climate offered many resources to early human groups (Scerri et al 2018). In addition, the discovery of Homo sapiens fossil remains encourages interdisciplinary research to reconstruct human adaptations in this region during Pleistocene and Holocene times (Groucutt et al 2017).

Faid archaeological site is located on the margins of the Nefud Desert, more specifically in-between this desert zone and Dawadmi in central Saudi Arabia (Fig. 1). Within

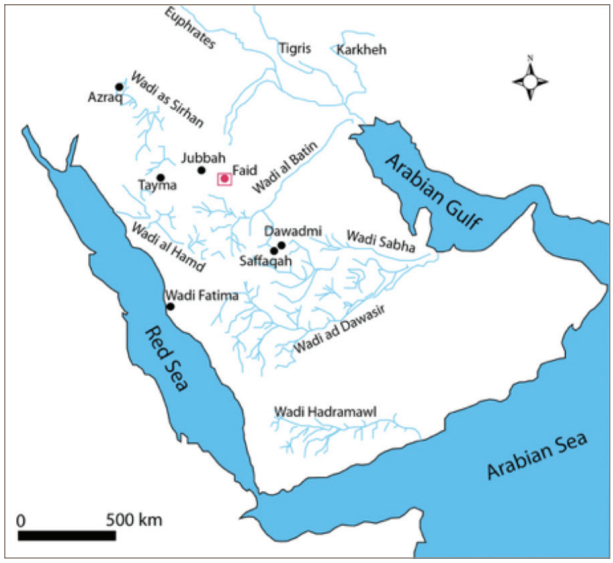

Fig. 1: The Site of Faid and the Main Paleolithic Sites in Saudi Arabia (Modified by Nassr 2019, Source Shipton et al 2018).

the archaeological research project of the University of Ha'il at Faid, season 6-2019, an archaeological survey was conducted at Faid site and its surroundings. The Survey aimed to record the main site chronology and context, where a new Acheulean occupation site was discovered.

This paper aims to provide observations on the discovery of weathered large Acheulean stone tools found at the site of Faid, from site setting, artifact agglomeration and regional comparison of stone technology and typology.

There are two main factors that led authors to investigate prehistoric settlement in the area; A): One single handaxe had been found in season 2-2015 in the context of Islamic building, which indicates some Paleolithic occupation around the area (Alhawas et *al 2015*). B): Landscape of area around the site included shallow and wide channels, Pleistocene deposits and gullies. These geomorphological settings indicate Paleolithic habitations. The site shows flat mounds of volcanic outcrops on the margin of wide depression encompassed by a mountain in

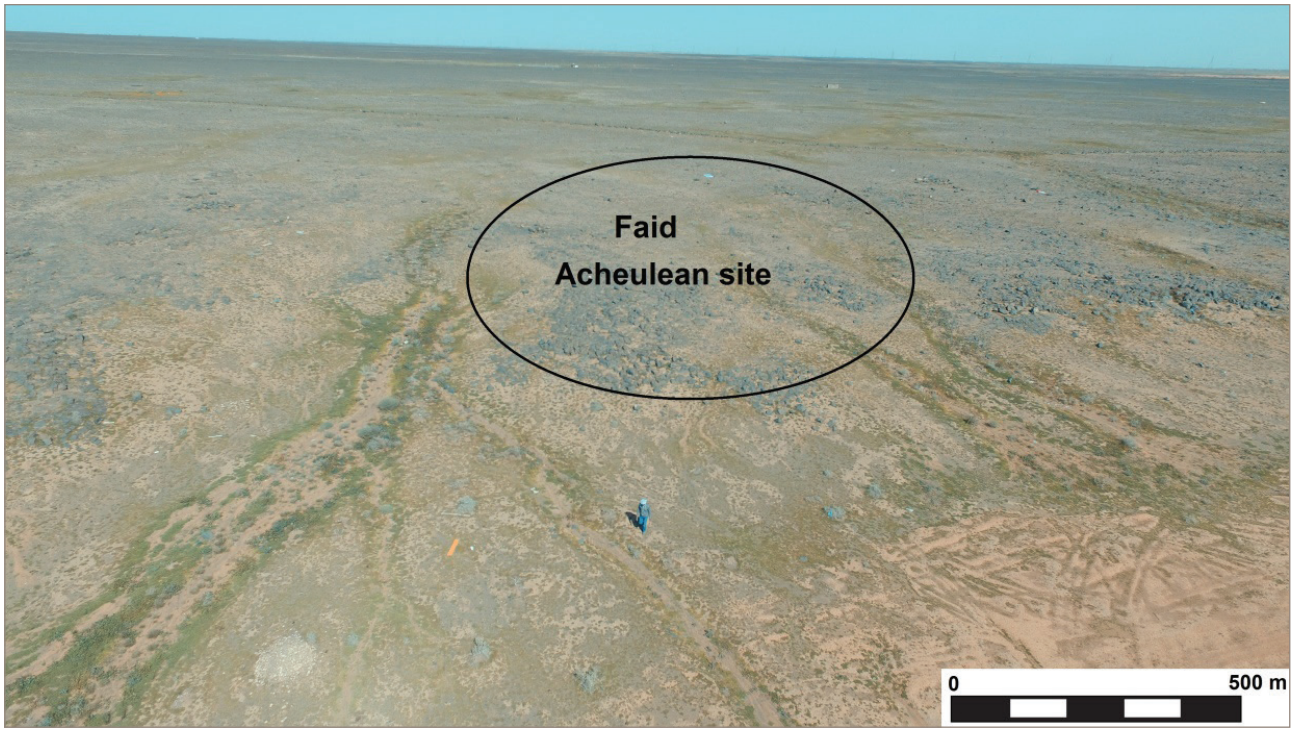

Fig. 2: An aerial photo of Faid Acheulean site.

the south and a plateau in the north. The authors employed a foot ground survey, following the channel from south to north to explore volcanic outcrops along the depression. About 600 meters north of Faid site an agglomeration of Paleolithic stone artifact was observed. Some Acheulean stone artifacts from large bifacial cutting stone tools highly accumulated on the surface and covered an area of 300x250 meters at the foot of volcanic gulley outcrop to the western beach of the depression (Fig. 2).

The discovery and Paleolithic site setting at Faid: N 27° 07′,25 E 42° 31′,50

Faid of today is a village that lies about 110 km south east of Ha'il in the northern region of Saudi Arabia. Historically, the area is well known as an ancient Islamic town located on the main Hajj road which connected Iraq and the Holy town of Makkah (See *The archaeological Project of report 2015*). The site contains a large extension of an urban Islamic settlement covering more than 2km². The focal area included volcanic outcrops exposed on open gullies adjacent to shorelines and encompassed by a huge mountain in the south. The channels drained from the inland plain to the dry oasis close to the mountain, where the historical town is located nearby.

The present systematic survey conducted at the town site showed the existence of a few such prehistoric tools, including flakes, a small blade and a handaxe. This gave us more encouragement to follow the depression margins stretching throughout the inland up to the north. The primary rationale for targeting this depression was the topography, which is similar to the main situation of Paleolithic region in Saudi Arabia (Jennings et al 2015). The Paleolithic site at Faid was discovered on the foot of rocky gullies of volcanic outcrops on the margin of the shoreline depression.

The surface of the site showed high

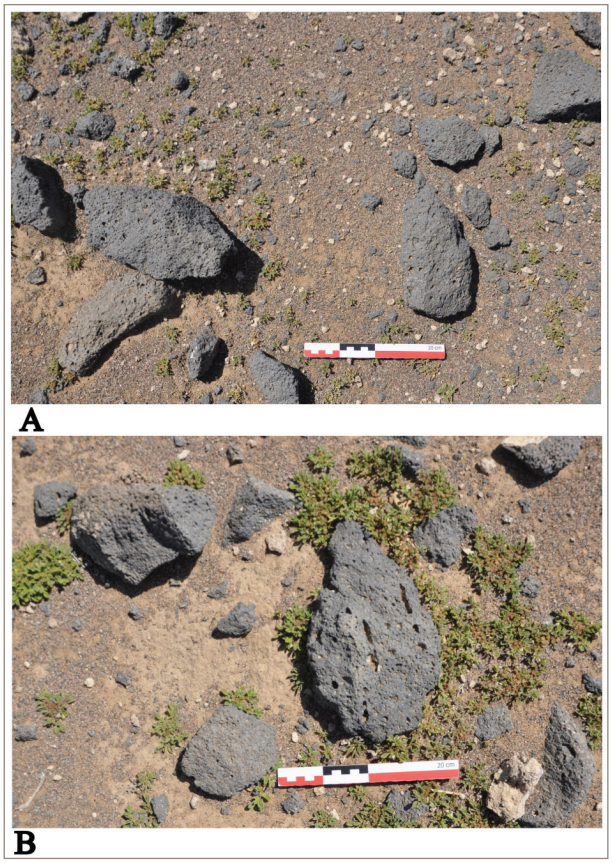

Fig. 3: An accumulation of large Acheulean cutting stone tools on the site surface (A: cleavers and chopping tools, B: Handaxe).

concentrations of Paleolithic stone artifacts that included cores, large flakes, bifacial Acheulean stone tools. Artifacts were found accumulated on the surface of alluvial deposits and among volcanic outcrops and channel profiles (Fig. 3).

The geology of the site is characterized by igneous bedrocks, covered by outcrops of volcanic rocks and Pleistocene fluvial sediments. Paleo-environment landscape has been identified from the site topography on high mound interface of extinct depression system, which indicates a wet Pleistocene weather (probably as an oasis).

The site setting revealed evidence for a group of Acheulean hominin who have occupied the gullies on the bank of Paleo-depression in small camp. This landscape of the site is similar to that identified in previous research of Pleistocene archaeology in Saudi Arabia, such as Dawadmi and Saffaqah (Whalen et al 1983; Shipton et al 2018; Scerri et al 2018).

North of this potential Acheulean site, our survey followed the depression into the plateau, where there are flat fluvial sediments, LatevHolocene sediments and a few chert and volcanic outcrops. Stone artifacts were observed, a few of them were found in concentrations. Assemblages recorded consisted of Levallois cores, Levallois points, Levallois flakes and sharp blades. No handaxes or other LCTs were identified. These assemblages of stone artifacts were indicators of eroded Middle Paleolithic camps along the depression.

Sampling method of stone artifacts

Some authors carried out foot systematic surveys supported by Arial photography. Documentation of site topography and exploration of stone artifacts concentration were the main methods conducted in the survey.

Preliminary random surveying to record stone artifacts patterns in situ was employed. The assemblages were sampled according to the stone artifacts variability in technology, typology and size. Our survey concentrated on gentle foot gullies, stable alluvial plains and outcrops adjacent to the depression.

Stone artifacts covered large space, throughout outcrops of volcanic into slope of the depression bank in concentrations and single distributions. The main concentrations of stone artifacts were affected by erosion and covered an area of 300x250 meters on the top of gulley and beach of the depression. Large cutting stone tools were the dominant features. Acheulean core and large handaxes, chopping tools and

point concentrations were documented on the surface and outcrops. Some small handaxes, points and flakes were found buried by young deposits of sediments. The highest density of stone artifacts concentration on the surface was (ca. 40 artifact per 20m²).

The agglomeration of large cutting stone tools and presence of cores and flakes indicate that these stone artifacts were locally made. On the other hand, all the artifacts made from local volcanic rocks show that these stone artifacts were knapped at the site.

Stone artifacts were documented in situ and about 35 artifacts were collected according to the variation of stone artifacts in technology and typology (Acheulean and Middle Paleolithic) (Fig. 4).

All finds found were highly weathered. LCTs were the main technological features; handaxes varying in shapes and sizes were the diagnostic patterns.

The stone artifacts concentrations and presence of bifacial large flakes with cutting edges and tip points show that the site is a typical Arabian Acheulean habitation. Acheulean mode 2 (bifaces and large cutting tools) and 3 (Prepared core technology) were the significant technological traditions. These patterns of stone artifacts are not common in Arabia archaeology and they resemble Dawadmi Acheulean tools in central Saudi Arabia (Petraglia et al 2010; Scerri et al 2015).

The stone artifacts agglomerations of cores, flakes, tools and waste found on the surface are indicators of a Paleolithic hunter camp and a stone knapping workshop.

Fig. 4: Acheulean stone artifacts collected from the site.

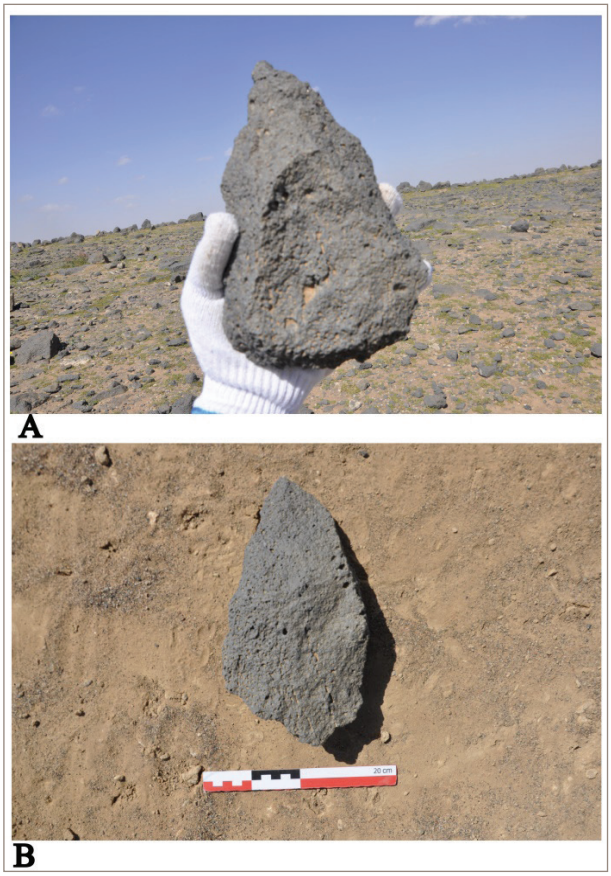

Fig 5: Large cutting stone flake technology.
A: flakes on the dorsal face 1, B: flake on the ventral face 2.

Stone artifacts characteristics and regional comparison

The preliminary observations of the stone artifacts are large Acheulean cutting stone tools, made of volcanic rocks. These stone tools were found to be highly weathered and accumulated on the eroded stoops sediments. Stone artifacts collected for study consisted of 35 artifacts. Basic analysis of these stone artifacts reveals some important elements, as large bifacial Acheulean flakes and Middle Paleolithic bifacial points. The large flakes indicated that the knapping process was primarily done by hard hummer percussion. This process yielded large flake on the tool axis with sharp working edges and tip end point and steep margin. Some of the stone tools were made of core with 50-70% cortex. Most of the tools were distinguished by large flake from straight striking platform on the butt and tool sides. Large flaking was the main technique geared toward sharp edges (around 5-7 cm flake). In terms of shapes, most of the tools are cordiform with concave, sharp edges and tip end slopping from the mid-point (Fig. 5).

Circular hard Hummer of different sizes made from volcanic rocks were found on the site surface. The small stone tools technology shows designs of Late Acheulean and Middle Paleolithic represented by bifacial reduction, triangular shape with end point and circular butt. This shows typical handaxes, bifacial points, spears, typical Levallois flakes and points, which were known in the Middle Paleolithic technology features identified from Nefud Desert and Jubbah (Petraglia et al 2011; Groucutt et al 2017; Groucutt et al 2018).

Handaxes are the maintainable stone tools of the Faid site, and are the diagnostic typology which included varying shapes and sizes, big handaxes, ovate handaxes, typical handaxes, cordiform handaxes and small handaxes. Most of the handaxes showed working edges, semi-circular butts and knapped from cortical or straight platforms to the tip end points. The numbers of flake scars of the big handaxes are 7-5 large flakes, which are made on a flake blank with the original dorsal face on one large flake on the ventral face. These large flake handaxes with sharp edges and end points are well known at Dawadmi area (Shipton et al 2014). Typical handaxes show medium size, triangular and ovate shape with end point (Fig. 6). These characteristics of handaxes in many sites were dated back to Late Acheulean at Dawadmi and Nefud Desert (Shipton et al 2018; Petraglia et al 2010).

Bifacial points with Levallois reduction

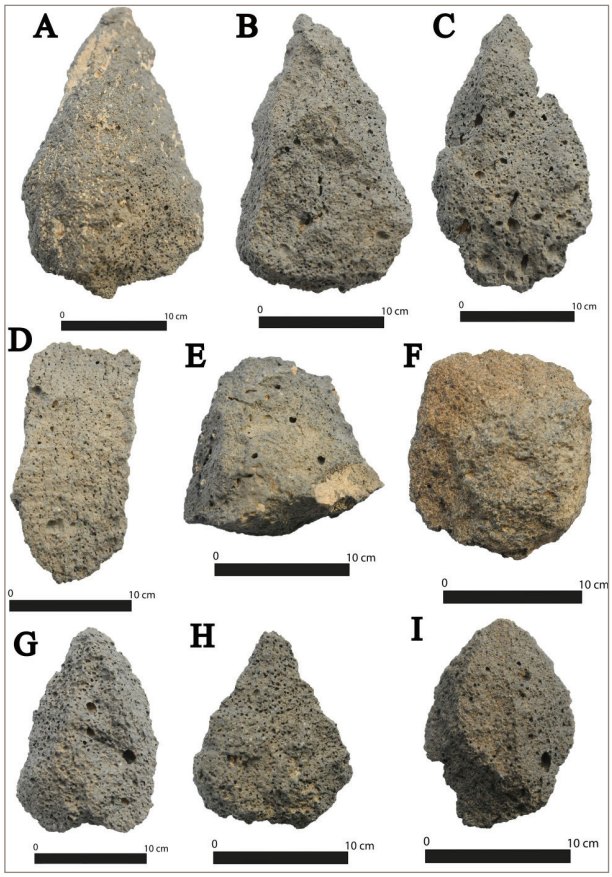

Fig 6: Diagnostics Acheulean and Middle Paleolithic stone tools at Faid (A-C: Big handaxes, D: cleaver, E-F Discs, G: foliate handaxe, H: Point, I: Levallois point.

features are also common, represented by triangular points, Levallois points made on side straight striking platform with sharp working stooping to the end tip points. Characteristics of points included Late Acheulean typology and Middle Paleolithic were well identified in the Nefud region, such as the site of Jubbah (Groucutt et al 2017; Scerri et al 2018).

The chopping stone tools, cleavers, Discs, Scrapers and hummers with Handaxes core and flakes were also collected, which confirmed the diversities of Acheulean and Middle Paleolithic stone artifact types at Faid site and indicated a long occupation period in the area.

The stone artifacts documented in the eastern part of Faid area are mostly Middle Paleolithic, including weathered Levallois cores, Levallois points and flakes with a few sharp blades.

Conclusion and remarks:

Stone tools technology collected from the site are represented by large flakes, sharp working edges, and points. Typologically, three main categories were identified: a) Handaxes, which were the main type of varying sizes and shapes; b) Bifacial modifications, triangular shapes, and Levallois technology; c) Various assemblages such as: chopping tools, cleavers, discs, scrapers, flakes, cores and waste. Overall, the categories are typical of the Acheulean and Middle Paleolithic artifacts.

Finding an Acheulean site at Faid is significantly regarded in terms of its additional knowledge to the Paleolithic archaeology in the northern interior region of Saudi Arabia. This sheds light on the connection between central Saudi Arabia and the northern frontier (Nefud desert). Also, the discovery of potential Acheulean and Middle Paleolithic stone artifacts at Faid will provide some opportunity to study the transition of Stone Age in this area. Paleolithic occupation at Faid could be compared with the neighboring Paleolithic regions in Arabia. This would lead us to discuss the human dispersal from the rocky area to the inland area through main sites like Dawadmi, Jubbah to the Nefud desert across Faid region.

The role of northern Saudi Arabia in the hominin dispersal from south Arabia further into the southwest Asia archaeologically is still under study (Alsharekh 2006, Petraglia et al 2011, Shipton et al 2014, Groucutt et al 2017, Groucutt et al 2018). Stone Age sites had been documented and revealed high concentration of Late Acheulean and Middle Paleolithic contexts (Scerri et al 2018). However, there

is a lack of stratified and datable context to reconstruct the site chronologies and cultural developments. Our survey highlights a new potential for research on the Acheulean and Middle Paleolithic in Saudi Arabia.

Finally, Levallois cores, Levallois points and small blades and arrowheads found in the eastern plateau, about 2-4 km from the potential site, could indicate movement from gulley to open land during Middle Paleolithic.

To conclude, the following can be suggested:

1. Discovered agglomerations of Acheulean large cutting stone tools at Faid site shed a new light of the site importance to the Saudi Arabia archaeology, not only in Islamic archaeology but in prehistoric times.
2. Stone artifacts surface accumulations with variability of techno-typological characteristics indicate that Faid had been occupied by Paleolithic groups over a long period.
3. Landscape of the site setting indicates that Faid was probably connected with Nefud paleo-channel systems through Wadi Al Batin during Late Pleistocene time.
4. The variability of different shapes of large cutting tools, from handaxes, cleavers, and discs, to chopping tools and points from volcanic rocks shows a good example of largely Paleolithic Archaeology of Saudi Arabia.
5. Excavations and absolute dating with more intense study of stone artifacts will be needed for more significant information.

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ملخّص: توصل البحث العلمي الرائد عن الآثار في الأجزاء الشمالية من المملكة العربية السعودية إلي حقيقة مفادها أن صحراء النفود هي إحدى المناطق التي نشأت فيها وانتشرت منها ثقافات ما قبل التاريخ في الجزيرة العربية. وعليه، ومنذ العام ٢٠١٤م درجت جامعة حائل على تنظيم حفريات أثرية في منطقة فيد التي تبعد نحو ١١٠ كلم جنوب شرقي مدينة حائل. وفي غضون بدايات العام ٢٠١٩م جرت أعمال الموسم السادس من المسوحات والتنقيبات في موقع فيد التاريخي، وحينها تم الكشف عن المنخفض القديم الذي يبعد نحو ٦٠٠ متر إلى الشرق من الموقع الأثري. وقد كشفت المسوحات الأثرية عن موقع مهم يعود للعصر الحجري القديم، يظهر تكدسا للأدوات الحجرية الكبيرة القاطعة على سطح تلال صخرية من البازلت على حافة مجرى مائي قديم. وقد توصلت المسوحات الأثرية القياسية إلى وجود انتشار للقطع الحجرية على السطح، وجرى تصنيف عينات منها إلى أن السمات التقنية والنوعية للأدوات الحجرية بالموقع هي بالطابع ذاته المعروف بالأشولية ذي الوجهين والأطراف القاطعة. كما أسفرت تلك الدراسات الأولية عن أن وضع الموقع الأثري والسمات المميزة للأدوات الحجرية تماثل ما هو معروف من آثار الفترة الأشولية من العصر الحجري القديم المبكر في كل من منطقة الدوادمي وصحراء النفود بالجزيرة العربية. هذه الورقة تلقي الضوء على الاكتشاف الحديث لموقع أشولي بمنطقة فيد الأثرية، وأهميته لدراسات ما قبل التاريخ في الجزيرة العربية.

Notes:

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