Quaternary International xxx (2016) 1–10

Contents lists available at ScienceDirect

Quaternary International

journal homepage: www.elsevier.com/locate/quaint

Filling in the gap – The Acheulean site Suhailah 1 from the central region of the Emirate of Sharjah, UAE

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ARTICLE INFO

Article history:
Received 14 January 2016
Received in revised form
21 September 2016
Accepted 24 September 2016
Available online xxx

Keywords:
Lower paleolithic
Arabian peninsula
Middle pleistocene
Late pleistocene
Handaxe

ABSTRACT

There is abundant evidence for an Acheulean occupation from many parts of the Arabian Peninsula. The archaeological record, however, features a significant gap in SE Arabia. Here we report new evidence for an Acheulean occupation from site Suhailah 1 (SHL 1) located in the interior of the Emirate of Sharjah, UAE. We present the lithic assemblage recovered during systematic field work in 2014. Results of our study include the documentation of the co-existence of bifacial and core technologies as well as a dominance of scrapers and bifaces in the tool assemblage. Based on comparisons with stratified and well dated assemblages from Jebel Faya about 50 km south of Suhailah we argue that the occupation of the site likely dates to the late Middle Pleistocene. One important implication of the discovery of Acheulean artifacts in SE Arabia is related to the question of the origin of the bifacial technology seen in the MIS 5e assemblages at Jebel Faya, which are thought to represent an early expansion of modern humans out of Africa. Our analysis shows that the Acheulean bifacial technologies from SHL 1 and from Jebel Faya cannot easily be linked developmentally, given typological differences and at least one additional occupation phase separating SHL 1 from the early Late Pleistocene occupation at Faya. We also observe typological differences among the SHL 1 tool assemblage and Acheulean assemblages from western and central Saudi Arabia. Given the scattered record of Acheulean sites in Arabia in addition to very little chronometric data, causes for these differences are difficult to assess and chronological as well as socioeconomic and environmental reasons have to be considered. We are still at the beginning of systematic research about the Paleolithic of Arabia. The intensification of research in the region over the past decade, however, provides promising possibilities for future research.

1. Introduction

Archaeological finds attributed to the Acheulean are reported from many regions of the Arabian Peninsula (Zarins et al., 1980; Whalen et al., 1983; Petraglia, 2003; Amirkhanov 2006; Groucutt and Petraglia, 2012; Shipton et al., 2014; Jennings et al., 2015; Scerri et al., 2015). While the geographically widespread evidence led to the conclusion that hominin groups carrying Acheulean technology occupied the entire Arabian Peninsula, mapping of the sites clearly indicates a gap in the distribution for the southeastern part (Petraglia, 2003). Although large handaxes have been reported from several localities in SE Arabia, none of them has been assigned to the Acheulean (Jagher, 2009; Scott-Jackson et al., 2009; Wahida et al., 2009). Jagher (2009) for example has argued that the large bifacially retouched artifacts from his survey in Central Oman at the first glance may recall Acheulean handaxes but the lack of the typical morphology of Acheulean handaxes with a tip opposed to a clearly identifiable base, separates the heavy bifacial tools of Central Oman from the Acheulean. Published illustrations of the handaxes found at Jebel Barakah, UAE (Wahida et al., 2009, Fig. 6) and during the surveys in Sharjah and Ras al Khaimah, UAE (Scott-Jackson et al., 2009, Fig. 9), allow similar conclusions for these assemblages from SE Arabia. Consequently, the SE Arabian archaeological record provides currently no convincing evidence for an Acheulean occupation, which stands in contrast to other parts of the Arabian Peninsula.

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http://dx.doi.org/10.1016/j.quaint.2016.09.053
1040-6182/

The discontinuous distribution of Acheulean artifacts over Arabia raises the question whether the geographic distribution merely reflect research history or if the gap in SE Arabia indicates that Acheulean groups did not disperse into SE Arabia? The desert environments of the Rub' a-Khali, the currently largest sand sea in the world (Edgell, 2006), separate SE Arabia from the rest of the Arabian Peninsula and might have hindered an occupation. Important climatic oscillations during the Pleistocene, however, have periodically led to more favorable conditions (Parker, 2009; Munro, 2012; Atkinson et al., 2013) potentially transforming the desert barrier into a corridor (Breeze et al., 2015). To gain more insight into these and other questions related to the Acheulean occupation of the Arabian Peninsula we need a better understanding of both technological and chronological patterns in the archaeological record. The majority of Acheulean sites in Arabia are surface sites, providing only limited information on the typo-technological repertoire of the occupants and their behavioral spectra. While saying this, excavations at site Saffāqah near the town ad-Dawādmi in central Saudi Arabia (Whalen et al., 1983) and excavations of stratified deposits with Lower Paleolithic material in Yemen (Amirkhanov 2006) clearly demonstrate that Arabia bears potential for stratified material from the Lower Paleolithic. Despite this potential and an increasing number of field projects (Delagnes et al., 2013; Bailey et al., 2015; Scerri et al., 2015; Hilbert et al. in press), Lower Paleolithic research in Arabia is still in an early stage compared to neighboring regions in the Levant and Africa where rich archaeological records allow detailed studies about variability in stone tool assemblages and hominin behavior as well as chronological studies to build regional Acheulean cultural stratigraphies.

In this paper we report the discovery of site Suhailah 1 in the interior of the Emirate of Sharjah, UAE. The University of Tübingen has conducted field work here since 2012 in collaboration with the Directorate of Antiquities of Sharjah's Department of Culture and Information. Our data provides evidence for an Acheulean occupation of the interior of Sharjah Emirate and thus helps filling the SE Arabian gap of the spatial distribution of the Acheulean in Arabia.

2. Geographic setting

The central region of the Emirate of Sharjah, UAE is located about 60 km inland from Sharjah city and about 50 km west to the coast of the Gulf of Oman (Fig. 1). The al-Hajar Mountains form the eastern border of this region. To the west of the al-Hajar Mountains, spans a plain of about 20 km width. The plain inclines slightly and drains surface and underground water from the mountains towards the west leading to relatively wet conditions in the plain with a relatively well-developed vegetation cover. The current floral community in the plain includes taxa like *Acacia tortilis*, *Haloxylon salicornum*, *Rhazya stricta*, *Prosopis cineraria* and *Ziziphus spina-christi* (Bretzke et al., 2013). The attractiveness of Sharjah's central region throughout human history is reflected in the rich prehistoric record of the region including finds from the Paleolithic (Armitage et al., 2011), Neolithic (Uerpmann et al., 2013), Bronze Age (Jasim, 2012), Iron Age (Cordoba, 2003) and Mleiha Period (Attaelmanan and Yousif, 2012).

Suhailah is the name of a region in the northern end of the interior plain, about 10 km north of the city al-Dhaid. The site is located on gentle hills about 5 km east of the al-Hajar Mountains. Ophiolite forms the base of these hills, which is overlain by the middle Miocene to Pliocene Barzaman formation and covered by pale brown to reddish yellow sediments containing nodules of gypsum or other evaporative minerals of unknown age. The hills are surrounded by alluvial fan gravels deposited by channels draining surface water from the al-Hajar Mountains to the west. Today, the wadi passes south of the site at a distance of about 700 m.

3. Material and methods

The site was discovered in 2012 during a general exploration of the region by two of us (EY, KB). We documented the location of two handaxes (Fig. 2) and the related lithic assemblages using GPS coordinates and named the site Suhailah 1 (SHL 1) following the system of Sharjah's Department of Antiquity for documenting archaeological sites. The number indicates that we encountered multiple sites from different prehistoric periods in the region and reflects the order of discovery.

Systematic field work at SHL 1 began in 2014 with the establishment of an x-y-z grid for the documentation of the exact locations of the finds. The core area of the artifact distribution at SHL 1 expands in north-south direction between two bands of chert cropping out of the sediment (Fig. 3). The density of finds is highest in the backslope while gradually thinning out towards the footslope in the west. The site's core area expands over 30 × 30 m in the upper part of the slope (Fig. 4).

SHL 1 (N 25.37°, E 55.99°) is located in direct vicinity to an outcrop of brownish chert with high quality for flaking. Within a distance of less than one kilometer there are two other outcrops of fine grained chert ranging in color from red to green and black. The site's location led us initially to expect that SHL 1 mainly represents hominin activities related to the supply of raw material. To gain insight into the nature of the lithic assemblage we began our systematic work at the site in 2014 with collecting all lithic artifacts from the surface of a 2 × 10 m trench (Tr 1, Fig. 4). We documented the spatial distribution of the finds by piece plotting each collected artifact using a Leica Total Station (TCR 407). The documented assemblage includes artifacts of all size classes. Given the proximity to naturally occurring chert, we applied strict criteria to distinguish artifacts from naturally occurring chert fragments and accepted the possibility of documenting too few angular debris which are normally part of the reduction process. Besides retouched artifacts, we recorded only those artifacts that featured clear morphological characteristics related to an intentional production, such as striking platforms with appropriate angles, clearly identifiable dorsal and ventral sides as well as bulbs of percussion.

In 2015 we began testing the site for the presence of stratified artifacts. Building on our work in 2014, we started excavation in Tr1 in two 2 × 1 m areas at the western and eastern end of the trench (Fig. 3). Excavators worked within our grid in quarter meters by digging *Abträge* that followed the slope of the deposits rather than digging in horizontal spits. The center point of the area excavated to fill one bucket was measured with the Leica Total Station to document the position of the removed sediments within the established coordinate grid. All sediments were screened through 5 and 7 mm mesh. Artifacts discovered during the excavation, usually those larger than 1 cm, were piece plotted using the Leica, while the location of the finds recovered by screening is given by the x-y-z coordinates of the related buckets. In addition to the excavations in Tr1, we systematically collected all artifacts from the surface of the ~900 m^2 core area by walking overlapping horizontal transects perpendicular to the slope in north-south direction (Fig. 4).

Given that there is no established classificatory system for Paleolithic artifacts in Southern Arabia, we follow the unified taxonomy proposed by Conard et al. (2004) to organize the cores of our assemblage. One advantage of this taxonomy is its focus on fundamental principles of lithic reduction allowing assemblages from multicomponent sites to be classified using one

Please cite this article in press as: Bretzke, K., et al., Filling in the gap – The Acheulean site Suhailah 1 from the central region of the Emirate of Sharjah, UAE, Quaternary International (2016), http://dx.doi.org/10.1016/j.quaint.2016.09.053