

Palaeolithic Landscapes & Archaeology of the Southwestern Arabian Peninsula: Preliminary Reconnaissance in Jizan Region, Saudi Arabia

Robyn Inglis^{1*}, Maud Devès², Matthew Meredith-Williams¹, Abdullah Alsharekh³, Saud Al Ghamdi³, Geoffrey King^{1,2} and Geoff Bailey¹

¹Department of Archaeology, University of York, UK; ²Laboratoire Tectonique, Institut du Physique du Globe, Paris, France; ³College of Tourism & Archaeology, King Saud University, Riyadh, Saudi Arabia.

*Corresponding Author: robyn.inglis@york.ac.uk

1. Introduction

The archaeology of the Arabian Peninsula is pivotal to understanding Pleistocene hominin dispersals from Africa. Emphasis on the Nile-Levant dispersal route has been challenged by evidence for a Southern Route out of Africa, through the Bab al Mandab Straits into Arabia (e.g. Beyin 2006; Petraglia and Alsharekh 2003). Despite recent key developments in our knowledge of the hominin occupation of the Arabian Peninsula (Armitage *et al.* 2011; Delagnes *et al.* 2012; Petraglia *et al.* 2011; Rose *et al.* 2011), our understanding of the Palaeolithic archaeology of the region remains patchy.

Dispersals into Arabia were probably controlled by global climatic and sea level fluctuations, with low sea levels allowing dispersals across the Bab el Mandab Straits (Bailey 2007), and humid periods allowing the occupation of present-day deserts (Petraglia *et al.* 2011). Within broad-scale climatic reconstructions, the physical morphology of the landscape is key; it can alter wider climatic trends at the scale experienced by hominin populations, and dictates the distribution of resources vital to human occupation, such as water and raw materials. Landscapes with 'dynamic' characteristics, such as tectonically active, or coastal, areas may have created attractive conditions for occupation through their potential concentration, and repeated renewal, of such resources (Bailey and King 2011).

The 'Dynamic Landscapes, Coastal Environments and Human Dispersals' (DISPERSE) Project aims to develop methods for reconstructing dynamic landscapes in prehistory, and their impact on patterns of human evolution and dispersal. It will utilise remote sensing techniques, alongside archaeological and geomorphological field survey on land and underwater, to reconstruct landscapes around the western Arabian escarpment and the now-submerged territory of the southern Red Sea.

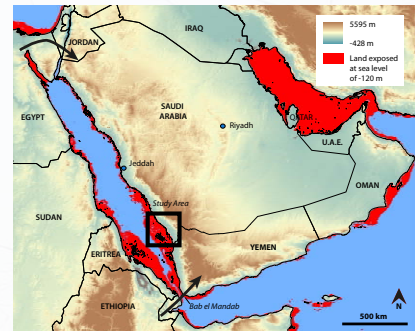
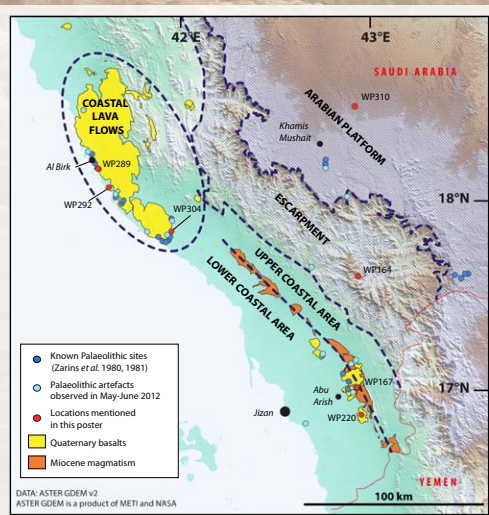


Figure 1: Map of Arabian Peninsula showing study area and potential dispersal routes out of Africa. Land exposed during periods of low sea level (fully glacial conditions) are also shown.

2. Preliminary Reconnaissance May-June 2012: Outcomes

The aims of the reconnaissance were:

1. To characterise landscape zones - from the coastal plain to the Arabian escarpment - as a function of the geology and geomorphology.
2. To identify areas for systematic archaeological survey based on observed archaeology and the sedimentary characteristics of each zone.
3. To locate stratified sediment sequences for local palaeoenvironmental and landscape reconstruction.



A. The Arabian Platform was only briefly explored, but contains landscape features that vary with the underlying geology, from sandstone valleys (Figure 3a), potentially containing rockshelters, to isolated granite hills. An extensive scatter of Palaeolithic artefacts and adjacent Neolithic structures observed within a wadi valley (WP310, Figure 3b) indicate significant archaeological potential.



Figure 3: a) area of sandstone on Platform with potential for rockshelters. b) WP310, with potential Neolithic structures in foreground, and Palaeolithic artefacts scattered across slopes in the background.

Figure 2: Map of study area showing landscape zones classified during the reconnaissance, known Palaeolithic sites (light blue, from Zarins *et al.* 1980, 1981), locations where Palaeolithic artefacts were observed during reconnaissance (blue) and locations mentioned in this poster (red). The areas of Quaternary and Miocene volcanics illustrate both the extent of the lava flows around Al Birk, and the concentration of flows along the 'Magmatic Line' between the Upper and Lower Coastal Areas.

B. The Escarpment is characterised by narrow valleys and steep slopes (Figure 4a), rising from the coastal plain to the Platform. Isolated sandstone areas, e.g. Wadi Lajab (WP 164, Figure 4b), are associated with springs and tufa outcrops. The heavily eroded landscape appears unpromising for preservation of archaeological material, however, a few enclosed basins contain preserved sediments.

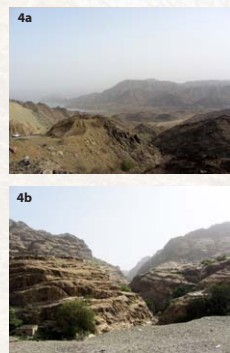
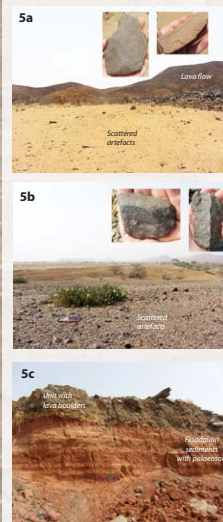


Figure 4: a) Steep valleys, at foothills of escarpment, and the artificial lake created by the Wadi Bayish dam. b) The sandstone area of Wadi Lajab, WP164.

C. The Coastal Area gently rises from sea level to the foot of the escarpment, its landscapes varying as a function of the underlying tectonic and volcanic processes. The area can be divided into:



D. Coastal Lava Flows dominate the landscape around Al Birk, extending ~100km. The Quaternary basalt flows were a major source of raw material, with Acheulean and MSA artefacts previously recorded (Bailey 2007; Zarins *et al.* 1980, 1981) and Palaeolithic artefacts noted in this survey. Artefacts were also found on coral terraces, overlying lava flows close to the coast.

Coral terraces at a number of heights were observed along the coastline (Figure 6a). Together with exposed marine sediment sequences (Figure 6b), these terraces contain significant potential for tracing sea level change and local uplift, key in assessing landscape evolution and potential prehistoric coastal occupation.

At the edge of the lava flows, where the coastal plain sediments are exposed by a quarry, a deep stratigraphic sequences containing >3m of lacustrine deposits, covered by terrestrial sedimentation (WP304, Figure 6c) was observed, with significant potential for palaeoenvironmental reconstruction.



Figure 5: a) Coral terraces at WP289 overlying basaltic lava flow, with potential Palaeolithic flakes recovered from the surface of the same terrace c.300m away. b) Corals and marine sands exposed in a quarry at WP292. c) Lacustrine sediments exposed in quarry below terrestrial sediments at WP304

Upper Coastal Area and 'Magmatic Line' - A line of hills formed by Miocene and Quaternary volcanics (the 'Magmatic Line'), divides the Upper from the Lower Coastal Area. The Upper Area has a steeper slope than the Lower, dissected by a dendritic pattern of small wadis. The Line is a major topographic feature, potentially formerly redirecting and damming wadis flowing from the escarpment, as well as providing raw materials in the form of volcanic lava flows (WP220, Figure 5a).

Multi-period artefact palimpsests, including basalt Palaeolithic endscrapers, were mainly found exposed on deflated surfaces, often on wadi terraces (WP167, Figure 5b). In Wadi Jizan, 6-10m of floodplain deposits were preserved beneath a lava flow (WP157, Figure 5c) indicating significant potential for palaeoenvironmental reconstruction as well as preservation of stratified archaeology.

The Lower Coastal Area, extending 20-30km inland from the coast and largely devoid of topographic features, is dominated by Quaternary fluvial, aeolian and marine deposits incised by wadis. Outside of the wide, shallow wadi beds, dunes and sparse shrub vegetation dominate.

Little surface archaeology was observed, probably due to the significant sediment cover. Future research will focus on areas that afford access to stratigraphy, such as wadi cuts and quarries.

Figure 6: a) Palimpsest of potentially palaeolithic artefacts and pottery on area of sediment close to volcanic jebel, WP220. b) WP167, multi-period scatter on wadi terrace, with Palaeolithic endscrapers. c) Wadi floodplain sequence with palaeosols, capped by unit containing lava boulders laterally correlated with in-situ flow (WP155).

3. Conclusions and Future Directions

This preliminary reconnaissance has established a foundation for future research into the Palaeolithic landscapes of southwestern Saudi Arabia. The characterisation of landscape zones has provided a broad overview of sedimentation processes, and their bearing on archaeological taphonomy. This framework has informed on the evolution of the landscape driven by tectonic, volcanic and sedimentological processes that were potentially active over the time scale relevant to Pleistocene hominin occupation. Lastly, a number of locations with significant potential for palaeoenvironmental reconstruction have been identified.

Future research will focus on refining the classification of the landscape zones and dating their evolution. Parallel to the analysis and dating of palaeoenvironmental archives, systematic archaeological survey will be undertaken, targeting areas of high potential for surface archaeology as well as preservation of stratified sites. Ultimately, the data from these investigations will be considered within wider-scale regional modelling to reconstruct landscapes of hominin occupation in Pleistocene Arabia, and to contribute to the DISPERSE's aim to investigate the impact of dynamic landscapes on hominin evolution and dispersal.

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