

The Palaeolithic Occupation of the Red Sea Coastal Zone: New survey data from Jizan and Asir Regions, Southwestern Saudi Arabia

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1. Introduction

Southwestern Saudi Arabia is a crucial region in narratives of hominin dispersals from East Africa into the Arabian Peninsula and across the globe via the 'Southern Route' (Beyin 2006; Petraglia and Alsharekh 2003), particularly in dispersals of *Homo sapiens*, but also in dispersals of earlier populations. One of the wettest and most ecologically diverse regions in the Arabian Peninsula, it was easily accessible from East Africa across the Hanish Sill-Bab el Mandab during periods of low sea level (Lambeck *et al.* 2011), and was climatically buffered from the major periods of aridity that would have caused the interior of the peninsula to become uninhabitable. It also offered marine and littoral resources to Palaeolithic populations, yet little is known about the Palaeolithic occupation of the coastal region.

The ERC-funded DISPERSE project, a collaboration between the University of York, UK, the Institut du Physique du Globe, Paris, and King Saud University, KSA, has undertaken survey in Jizan and Asir regions (Devès *et al.* 2013; Inglis *et al.* In Press, 2014), and has so far identified over 60 new localities with Early, Middle and Later Stone Age (ESA, MSA, LSA) artefacts. These localities are situated in a range of landscape settings, including fossil beach terraces and lava flows. Whilst analysis of the material is ongoing, these new data are beginning to offer insights into the ways in which early hominin populations exploited the environments within the broad coastal zone of Southwestern Saudi Arabia, and the factors that may have facilitated their dispersal across the globe.

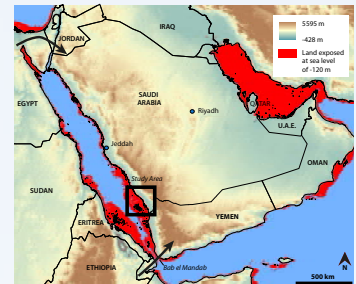
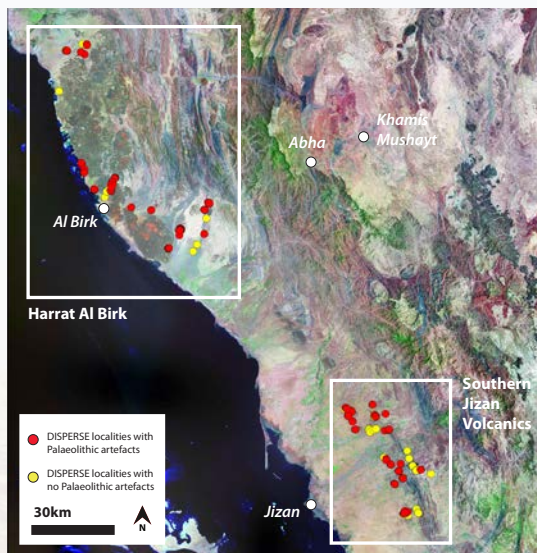


Figure 1: Map of Arabian Peninsula showing study area and potential dispersal routes. Land exposed during fully glacial low sea levels are shown in red.

2. Survey Methodology

Targets for survey were identified by developing broad scale landscape classifications using remote sensing data (LandSat ETM+ Geocover 2000 mosaics, GoogleEarth, CGIAR-CSI SRTM, ASTER GDEM v2) and reconnaissance in May/June and November 2012. Areas of low net sedimentation (e.g. lava flows) potentially contained easily accessible surface archaeology useful in observing spatial patterning; areas of high net sedimentation (e.g. alluvial fans) potentially held artefact-bearing stratigraphy and palaeoenvironmental sequences, accessible through wadi cuts and quarries.



3a. Quaternary Volcanics: Southern Jizan

The Jizan coastal plain is divided by a line of metamorphic schist jebels, associated with Quaternary cinder cones and lava flows (Figure 3a), as well as Miocene dyke intrusions. Eruption of the Quaternary volcanics would have significantly altered the local topography, potentially trapping water, attracting animal and hominin populations and providing a major source of raw material in the form of basalts and andesites

A low density scatter of artefacts exists across the flows, yet denser concentrations appear to be associated with views over the landscape, water (Figure 3b & c), or areas of finer-grained basalt. Basalt predominates as a raw material (Figure 3d), yet particularly in the MSA and LSA, other materials were exploited, such as cherts, shales and quartzite.

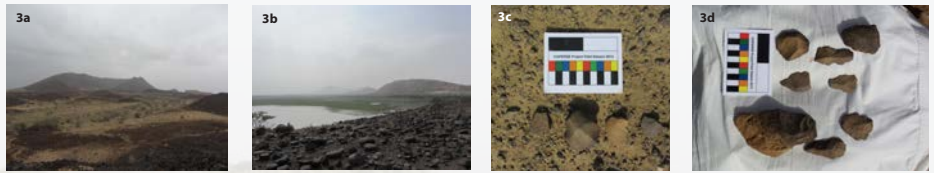


Figure 3: a). View across lava flow from collapsed cinder cone of Jebel Akwah. Photo: R. Inglis. b). View from edge of lava flow overlooking Wadi Jizan Dam lake, fed by the confluence of 5 major wadis. Photo: R. Inglis. c). Basalt cores and flakes from this lava flow. Photo: R. Inglis. d). Basalt MSA flakes from Jebel Unm Al Qumman. Photo: A. Sinclair.

Figure 2: False colour satellite of the study area, Jizan and Asir Regions, Southwestern Saudi Arabia showing localities identified by DISPERSE. Image: Satellite Imagery © USGS Landsat ETM+ 2000 Geocover Mosaics.

3b. Buried Floodplains: Southern Jizan

The lava flows in Southern Jizan covered large areas of fine-grained wadi floodplain sediments. These have subsequently been exposed in sections over 10m deep extending for kilometers in wadis and quarries.

DISPERSE located two isolated lithics stratified in deposits below lava flows and tuff deposits. In a tributary of Wadi Jizan (Figure 4a), a coarse chert flake was observed under a lava flow dated to 0.8 ± 0.3 mya (K/Ar date from Dabbagh *et al.* 1984).

In Wadi Sabiya, a shale clast worked using soft hammer percussion (Figure 4b) was recovered from a wadi terrace deposit overlain by volcanic tuff dated to 0.4 ± 0.2mya (*ibid*). These dates may be problematic, and redating is underway.

In addition, unstratified artefacts, including a sandstone handaxe, and a basalt cleaver with signs of heating (Figure 4c), were found in spoil from quarries through the lava flows. Whilst out of context, these may also hint at occupation of the area dating to before the eruptions.



Figure 4a: Floodplain sediments below lava in Wadi Jizan tributary. Figure indicates flake. Photos: G. Bailey.

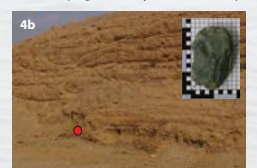


Figure 4b: Wadi sediments capped by tuff containing in situ worked clast. Photos: N. Hausmann, G. Bailey.



Figure 4c: Basalt cleaver from quarry beneath lava flow. Photo: G. Bailey.

3c. Coastal Deposits and Lava Flows: Western Asir

The coastline of the Harrat Al Birk lava fields, Asir Region, contains a series of raised beach deposits and coral terraces, overlying the lava flows. First identified by the CASP survey (Zarins *et al.* 1980, 1981), these terraces are associated with ESA and MSA artefacts that utilise local basal and andesite.

One site, Dhahaban Quarry, contains MSA lithics stratified beneath a complex of beach and coral terraces at +9m asl (Figure 5), as well as over 300 surface ESA and MSA artefacts. The embedded lithics are relatively sharp and contained within a wadi cobble unit that also includes rolled coral cobbles and giant clam shells. Dating of the overlying marine sediments is ongoing.



Figure 5: a) Area of beach deposits overlying wadi cobble unit with embedded lithics at Dhahaban Quarry. Photo: R. Inglis. b) Andesite flake embedded within wadi cobble unit, both prior to, and after, removal. Photo: A. Sinclair. c) Basalt flake accommodated within fine laminar shell sand unit that overlies the wadi cobble unit. Photo: A. Shuttleworth.

4. Summary

The 2013-14 DISPERSE surveys have identified significant archaeological material in the Jizan and Asir regions, including ESA, MSA and potentially LSA artefacts. Whilst analysis of the artefacts and their geomorphological settings is ongoing, some preliminary trends are visible, such as the potential attractiveness of locations with good views over the landscape, access to water and raw material, a deep antiquity of occupation within the region and the possible exploitation of coastal environments. These finds highlight the potential for Southwestern Saudi Arabia to inform on global dispersal debates.

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