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Paleolithic Research on the Red Sea Coast of Eritrea

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Project abstract

This ongoing project examines Paleolithic sites along the Gulf of Zula, Red Sea Coast of Eritrea (**Fig. 1**). The specific goals of the project are: 1) to excavate Middle Stone Age (MSA) and Late Stone Age (LSA) sites along the Red Sea Coast of Eritrea that were documented by a pilot survey in May 2005[1]; 2) to describe the geological context and spatial distribution of artifacts; 3) to map lithic raw material sources so that they can be integrated into models of industrial variability; 4) to characterize the variability of lithic and faunal remains at MSA and LSA sites; 5) to refine the chronology of the sites. Fieldwork has commenced in spring 2006 at the Asfet site on the southwest coast of the Gulf of Zula (Fig. 1.1). The research involved mapping (geological and topographic), surface artifact documentation and collection, and test excavations. This project forms the basis of my Dissertation Research. Staff members of the National Museum of Eritrea and Asmara University collaborated in the recent fieldwork at the Asfet site that, the results of the work are presented here.

Asfet. First discovered in May 2005, the site is located about 10 kilometers west of the Irafailo Village and immediately northeast of the road to Foro. Surface investigation and test excavations uncovered lithic artifacts and shells in close association, suggesting human coastal adaptations along the Gulf of Zula. It is situated in sand dunes between two north - south parallel running basalt ridges. Sediment appears to have either blown into the site from the coastal plain or washed in from a gap to the west of the ridges. Lithic assemblage contains a wide range of tools made on different types of raw

materials, with a strong laminar blade and Levallois technological component (Fig. 4). Some of the artifacts are also interstratified with eroding vesicular basalt cobbles and boulders. Lithic and shell analysis collected from the Asfet site is underway in the National Museum of Eritrea. The analysis results will reveal more about the nature of prehistoric adaptation on the region.

The modern seacoast is about 0.8 km northeast from the main site. Hot spring water that flows from the southeast of the site has been located in the recent fieldwork. The local communities consider the hot spring as healing water for infecundity and other chiropractic problems. It also serves as a stable water source for the growth of shrubs and mangrove plants around. The water is moderately salty and warm (about 70 ^{0}C). The presence of a hot spring in the area implies that the magma chamber is closer to the surface around that part of the Danakil Depression.

Geology of the Asfet area

The Asfet area is covered by a Quaternary Rift series basalts (**Fig. 2**). Three main basaltic lava flows are identified in the area; the lower flow, the scoriacious flow and the upper flow. All of the flows share one common feature that is they are olivine phyric.

a) *The lower layer***.** This basaltic flow is black when fresh and gray when weathered, which has about 2m thickness. It has fine-grained groundmass with olivine porphyry.

b) *The scoriacious flow***.** This flow is about half meter thick and it is easily recognized by its very rough and scoriacious surface. Though its fresh color is black and shows olivine porphyry, the superficial color of the flow is spotted varying from red, black to gray. In some cases where the upper flow is eroded away, fore example near the main Massawa – Assab road (Fig. 2 & 3), the scoriacious lava outcrops on the surface.

c) *The upper flow***.** This layer is also olivine phyric but vesicular. In some instances the vesicles are filled with amygdule. Color of the rock is black when fresh and brown to gray when weathered. Bottom part of this flow is affected by baking effect suggesting that the upper flow flew on the hot scoriacious lava with out a time gap. Maximum thickness observed is about 4m.

Moving south and southwest of Asfet area (with elevation 10-20 m above sea level), is a prominent mountain chain called *Berhaga* with an elevation as high as 286 m. The mountain chain is built of gneiss with intercalation of schist. These Neoproterozoic

metamorphic basement rocks served as a source for some of the Human artifacts found in the Asfa area. Exploiting strike of the metamorphic rocks, drainage patterns from the mountain flow toward NE. The surrounding of Asfet is mainly covered by alluvium.

Survey and Excavation

Garmin Geoexplorer Global Positioning System (GPS) device to plot locations of artifacts and archaeological localities was used. *ArcPad* and *ArcGIS* mapping software were employed to store and manage GPS data and produce large-scale maps of the sites. Topo map was produced for 52 ha area. In order to have adequate lithic sample for museum analysis, diagnostic artifacts were collected from each surveyed grid (**Fig. 3**).

Excavations have been conducted on locations of high artifact concentration using judgmental sampling (Fig. 3). Test excavation started with a 1m x 1m unit at the mid-western edge of the sandy area. Six test units (A-F) were opened. Out of all, Unit F was the most productive unit. The unit is located on top of the northern margin of the western basalt ridge. The surface is characterized by a high concentration of shell fragments on a small, secluded flat surface surrounded by basalt bedrock- boulders. It was dug to 30 cm below surface and lots of shell fragments were recovered from in situ in association with lithic artifacts (**Fig. 5**). Importantly, a shell with two obsidian debitage embedded inside with a soil matrix was found from about 7 cm below surface. The obsidian microdebitage reveal fresh surface and edge suggesting less work-impact.

Chronology

The absolute age of the sites is not known yet, but based on the common artifact types it appears a multi-component site where Earlier, Middle and Later Stone Age cultural periods are represented (**Fig. 4**).

Project Significance

There is a strong convergence of paleontological, archaeological and genetic evidence supporting the origin of modern humans in Africa [2, 3]. However, there is disagreement about the tempo and mode of modern human dispersals out of Africa [4]. Paleolithic investigations along the Eritrean Red Sea coast are important for human origins research because human populations specifically adapted to coastal environments in Northeast Africa are thought to have been source populations for human dispersal into Eurasia via Southern Arabia (the Bab al Mandab strait)[5].

Acknowledgement

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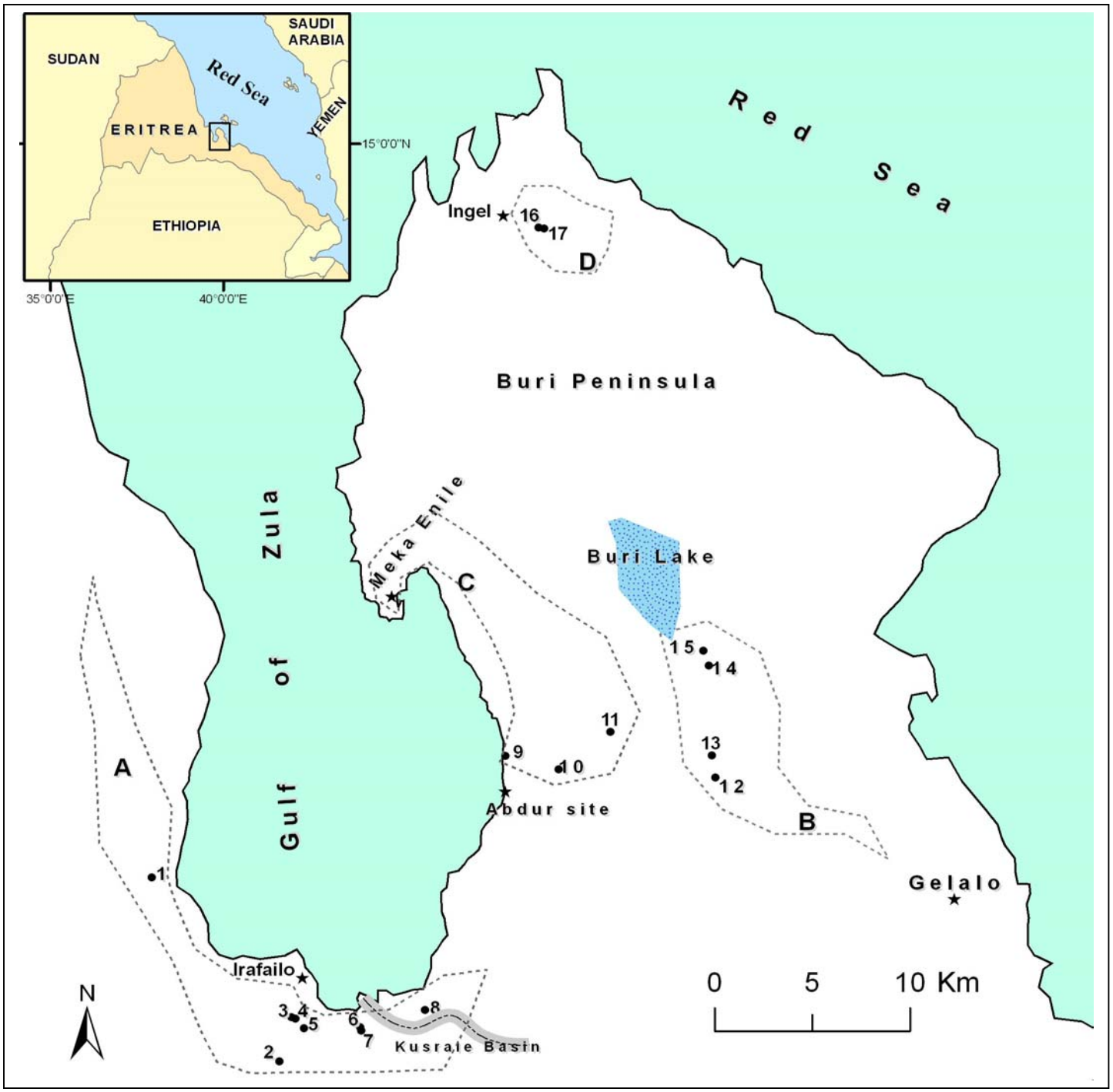
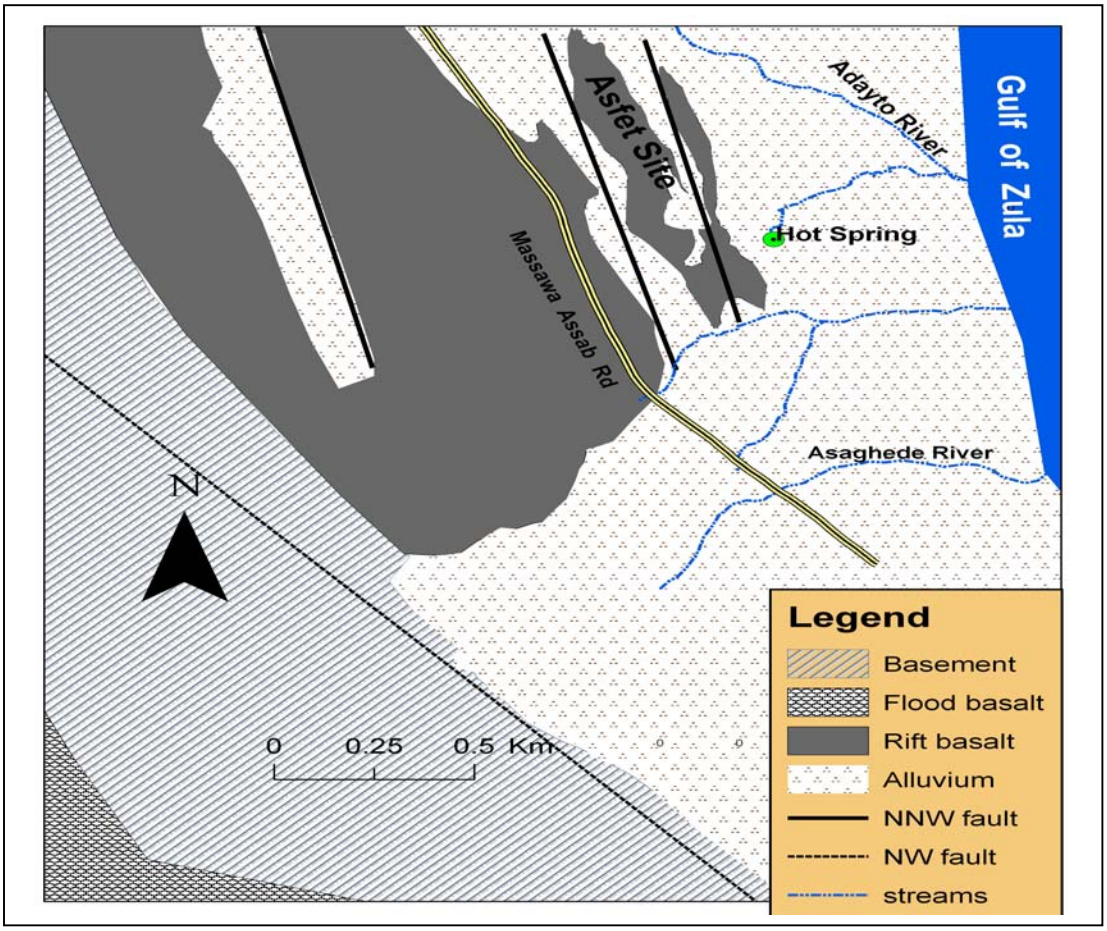


Fig. 1. Map showing the location of Paleolithic sites documented in the 2005 pilot exploration. Doted boundaries indicate the surveyed areas. Asfet site is marked #1.

Fig. 2. The Asfet site and its surrounding: Geological map and areal photo. Yellow dotted outline on the photo map shows the site boundary ().



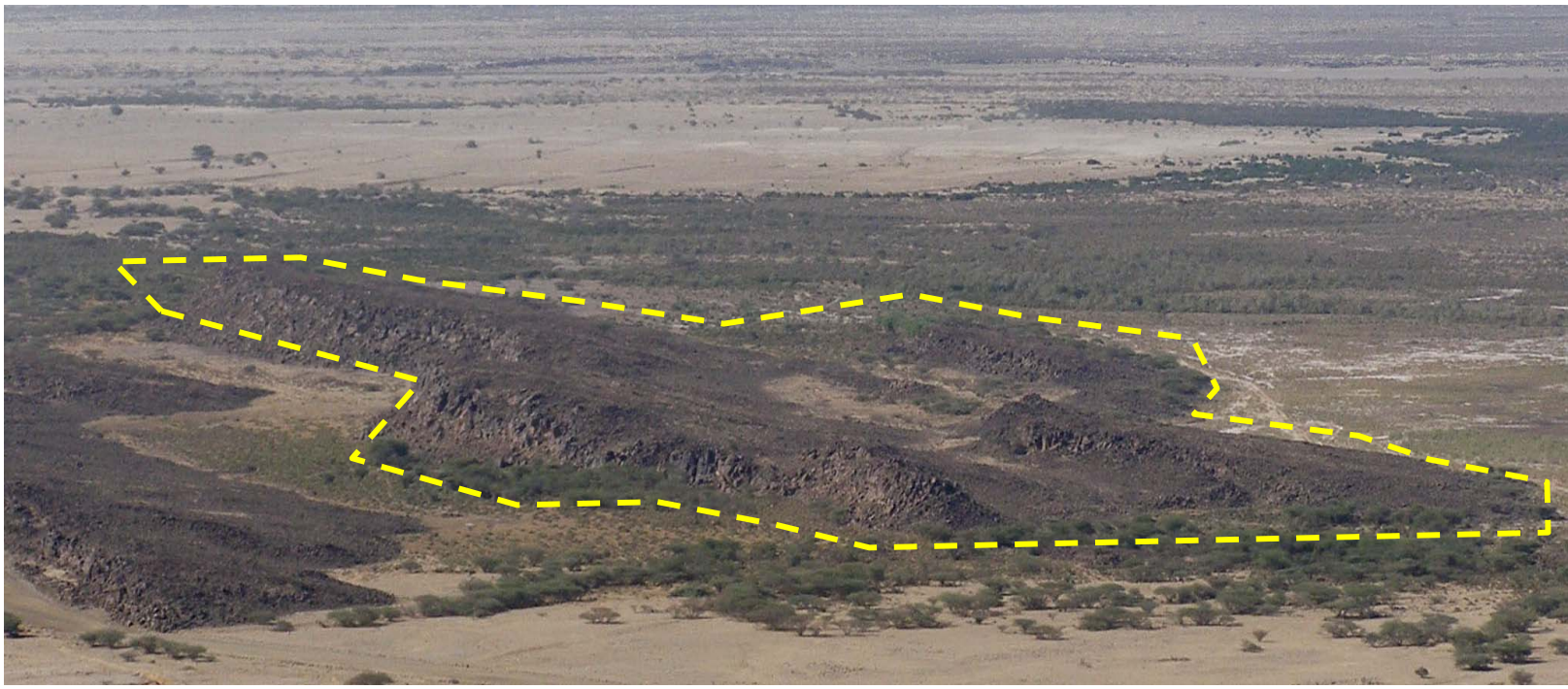


Fig. 3. Map showing the location of Excavation Units, Auger Test Excavations and the concentration features within the Asfet site

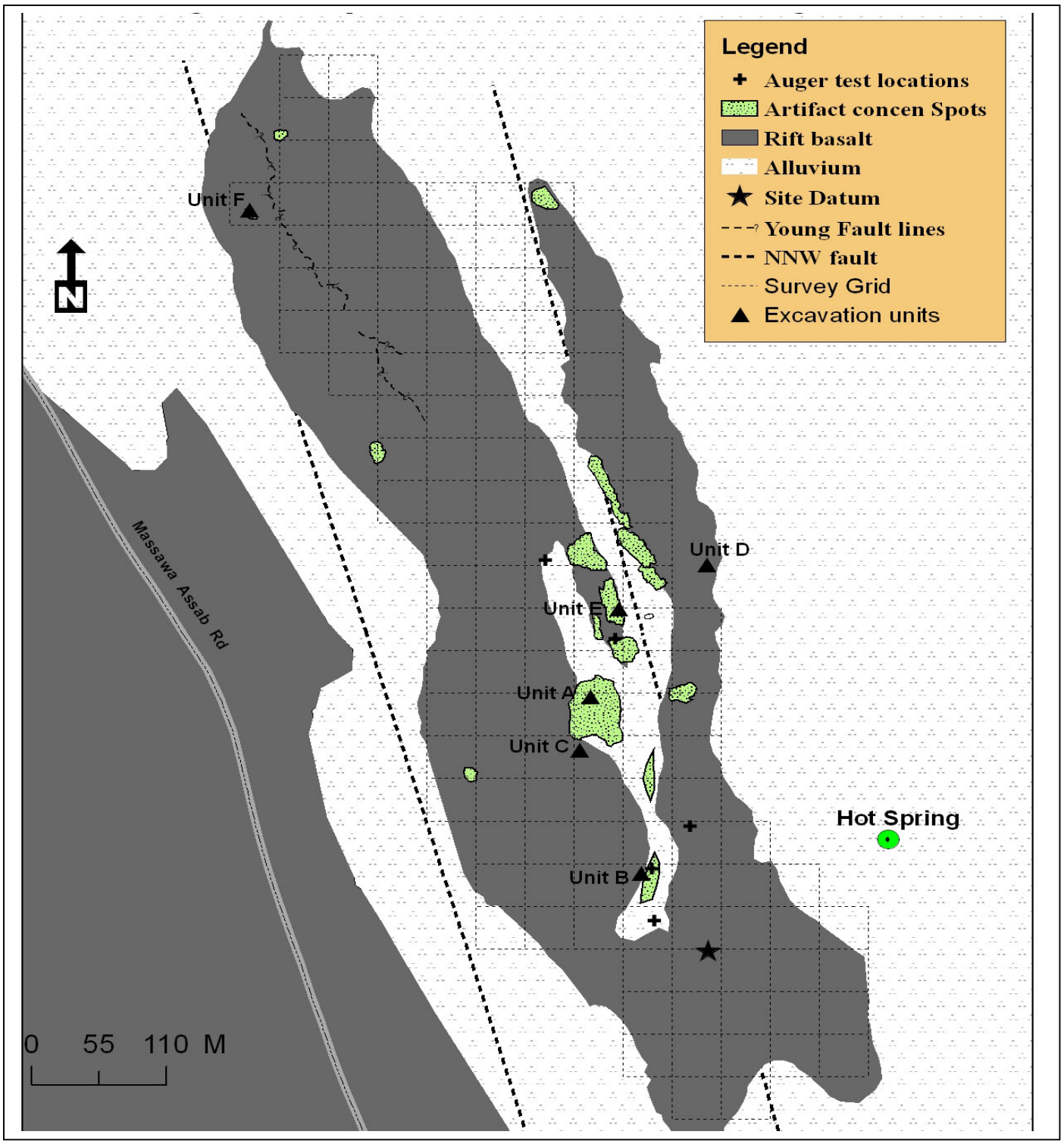


Fig. 4. **Representative surface artifact types from Asfet: A) Developed Oldowan handaxe on basalt, B) Prismatic blade core on obsidian, C) Chopper on basalt, D) Foliate point on rhyolite, E) Levallois core on basalt, F) Prismatic Levallois blade on rhyolite, G) Big basalt flake, H) Shell sample**

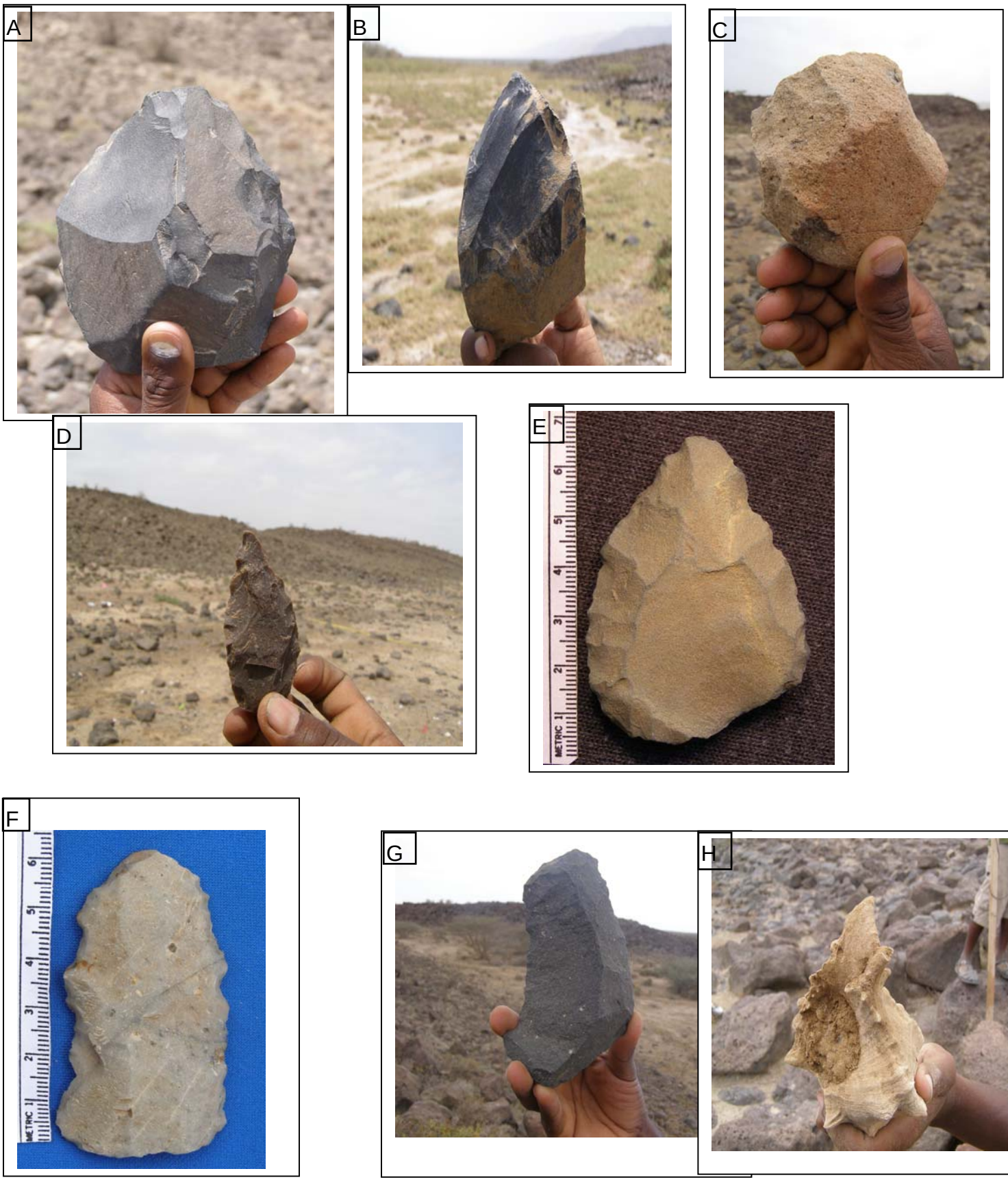


Fig. 5. Unit F Excavation findings