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The Benu rockshelter (Ceuta). Stratigraphic sequence and record of Hunter Gatherer societies of marine resources with Mode 3 technology in North Africa

Location, stratigraphy, chronologies

The Benu rockshelter (Ramos *et al.*, 2008; Ramos *et al.*, eds., 2013) is located in the North-African area of the Strait of Gibraltar, Ceuta. It is situated 230 m from the current coastline, 63 m.s.n.m., close to Algarrobo stream and Ballenera Bay.

It is located in Dolomitic marble Alpujarrides of the Triassic Age, with an abrupt topography and almost vertical walls. It has lost a part of its superior cover due to collapsing. Its dimensions are about 15.52 x 6.2 m, with a visor cover. In the southwest end there is a little cave with Neolithic settlements. The archeological deposit has got a surface of about 61.1m² with a power higher than 5.50 m of cemented carbonates sediment, with calcareous Geological divide and interspersed levels of sediment of calcites. Laterally this thickness reduces up to 1m. Ten strata have been identified, and seven of them have human occupation evidences of the Middle and Upper Pleistocene (Fig. 1).

During the cold stages of the Quaternary, sea-level fell more than 120m, generating a huge

platform that is immersed today. The immediate territory of the rockshelter offered the possibility to access large resources: marine, hunting, plants, water sources, lithic.

Several studies about micro morphology and bio-erosive processes in the environment of the Benu rockshelter show that its erosive process would be previous to human occupation, before e.i.9.

The investigation has been directed by J.Ramos and D.Bernal (University of Cádiz), and researchers belonging to different institutions have participated, also Co-operation agreements between University of Cádiz and the City of Ceuta have been developed. The studies have been done with the authorization of the Ministerio de Cultura.

The results of dates have been: level 7 (Th/U, IGM: ± 70 ky), level 5 (OSL, Shfd 020136: 168 ± 11 ky), level 3b (Th/U, IGM: 173 ± 10 ky), and level 2 (OSL, Shfd 020135: 254 ± 17 ky). In this way, the sediment and archeological sequence is previous to 70Ka and the register of the first human occupation of the rockshelter is before 250 ky.

Due to the peculiar characteristics of the site, a specific technology has been used; this has

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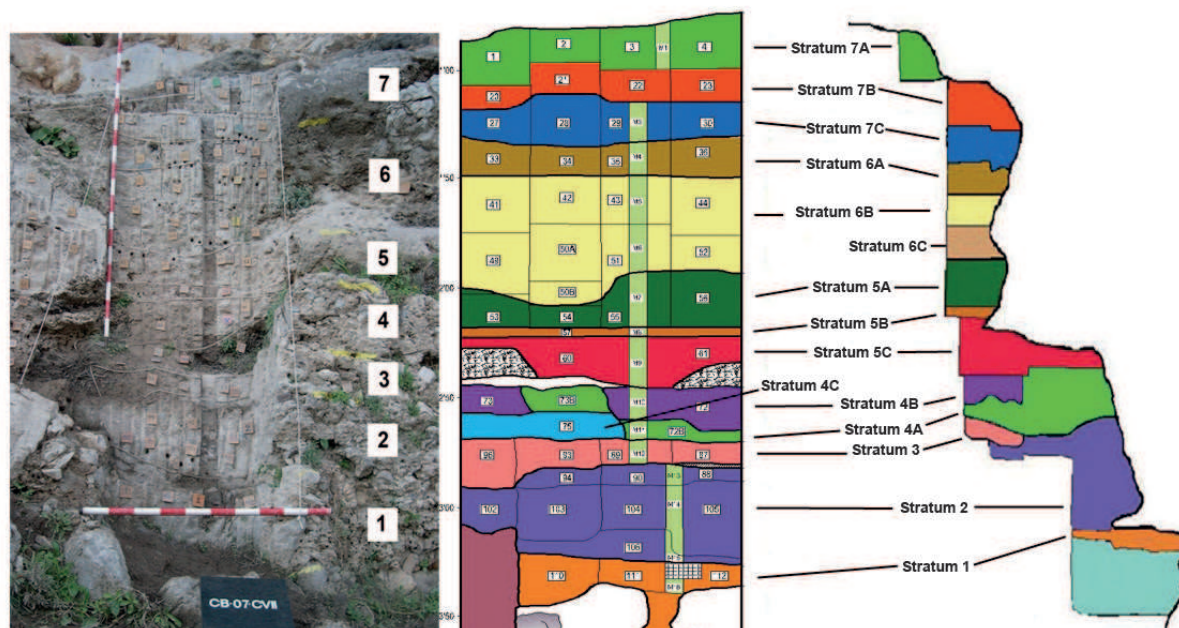


Figure 1. The Benu rockshelter. Stratigraphic profile

permitted the removal of blocks that have been finished to dig in laboratory with a micro spatial control of the products (Domínguez-Bella *et al.*, 2012).

Pollen, anthracology, terrestrial and marine fauna

Pollen analysis has shown that the territorial vegetation was mainly constituted by *Cedrus* and, in a minor extent, by *Pinus*. *Quercus-p*, *Olea*, *Ceratonia* and waterside elements, such as *Alnus*, *Salix* and *Ulmus*, have been developed. The shrubby herbaceous has mainly been constituted by steppe elements (*Artemisia*, *Asteraceae* and *Chenopodiaceae*). The shrub layer, with *Ericaceae* and *Juniperus*, did not have an important role. This composition shows Mediterranean characters conditions, primarily dry, with pathways of water which are more or less permanent and ponds which favor the development of waterside and aquatic taxa. Throughout the sequence, oscillations and changes in tendency to the decrease of the humidity rate occurred. A cyclicity happened with the installation of a forest including warm and Mediterranean elements together with a varied shrubby herbaceous vegetation and a high representation of waterside taxa and aquatic elements.

The Anthracological data have documented plant taxa: *Erica* sp., in strata 4, and *Fabaceae* in

strata 2. These two taxa have good flammable properties and could be used as fuels.

The terrestrial fauna consists of 3,362 bony fragments of medium-sized mammals and splinters, as well as pieces of humerus diaphysis of medium-sized ungulates. They were deposited as a consequence of human activity. Several areas of activity and possible consumption places in 4, 5 and 6 strata have been documented. There are lots of bony fragments presenting burned and deliberate fractures. Bovine ungulates and other medium-sized herbivorous predominate.

The marine fauna is documented with 144 fragments, showing an exploitation of coastal resources, underlining the presence of malacofauna –mainly Patélicos molluscs– in all the stratigraphic sequence. There is a clear predominance of the Gastropod Class faced with the Bivalvia, noticing the group of the non-spiraled gastropods and in particular the Patellidae family, followed by *Siphonariidae*, being *Siphonaria pectinata* the greatest exponent. In this way, there are specimens of *Patella* sp., among others. Referring to bivalves, its representativeness is attested to by the presence of some remains of the species *Tapes decussatus* in level 6, and others belonging to *Glycimeridae* family. Remains of ictiofauna vertebrae in level 5a are registered –possibly from the *Sparidae* family.

Lithic technology

From strata 1 to 7, 36,092 samples have been analysed. The raw materials basically come from the immediate environment of the site, underlining the compact sandstones –61.71%–, in the face of the red radiolarites rocks –36.37%–. There are other minority lithologies that would set a certain mobility of the human groups that frequented Benzú.

There is a predominance of rests of carve –35,322 samples– in the face of refinished products –763–. 523BN1G-Cores, 11,648BP-Flakes and 23,151 ORT-Others rests of carve have been documented. There is a remarked presence of levallois technique and Centripetal-Multipolar Core. Among flakes, the internal ones are the most representative, as well as those from the levallois technique. Tipometric Analysis show that flakes –95.76%– dominate over blades –4.24%–, with a significant presence of small-sized types. Among the retouched products-BN2G, scrapers dominate over notches, denticulates and points –Fig.2–. Five Operational Technique Indirect scheme have been documented: 1-Longitudinal, 2-Unipolar, 3-Centripetal, 4-Bipolar, 5-Multipolar, that show the technique process of the lithic production.

The functional study has documented traces of use in almost the 20% of the lithic rests analyzed. The wood working is documented in every archaeological level with more frequency than the activities for meat production and/or leather. However, in level 3 butchering is the most representative activity, and it is the only level where scraping of a hard material from animal origin is documented. There is a significant presence of thermal damage. The use of shrink fitting in an instrument is obvious in level 4.

Conclusions

The Benzú rockshelter was a place where Hunter gatherer societies of marine resources usually went, doing activities in a seasonal residence with production and consumption processes.

We discuss the register and documentation of leveraging practices of marine resources –fish and mollusks–. Species next to the coast have been collected, being an important resource and one of the most ancient evidences of fishing and shell fishing practices by prehistoric society.

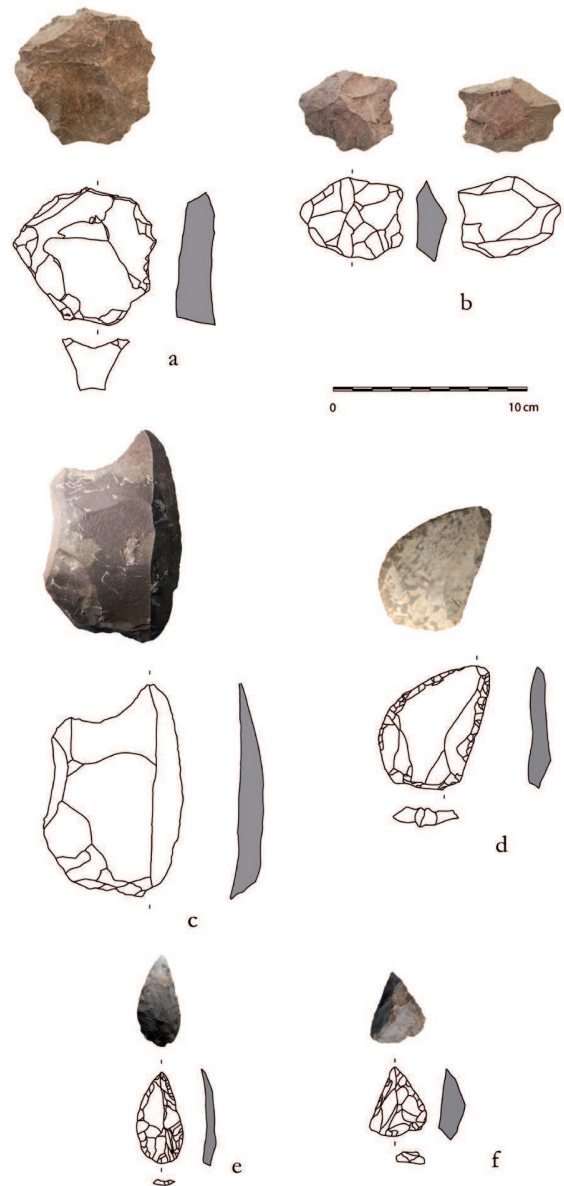
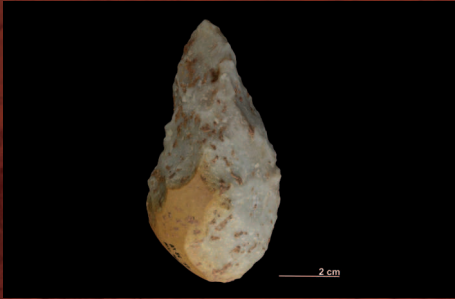
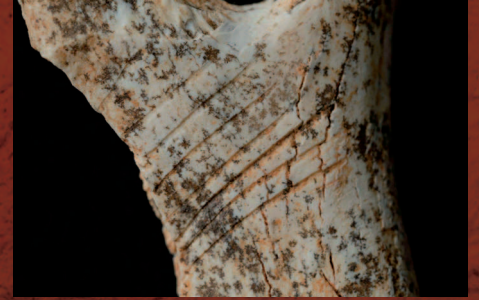


Figure 2. The Benzú rockshelter. Carved lithic products. a-b: Centripetal-multipolar Core; c: BP– Levallois Flake; d: BN2G.Scraper; e-f: BN2G-Points. (a-b: Strata 1, c-d-e-f: Strata 4 a).

The lithic assemblage is clearly mode 3, therefore Middle Paleolithic.

The use of fire related to processes of prophylaxis and cleaning has been proved.

In conclusion, there are no significant technical differences within the sequence. The technical systems of production and working show different ways of life based on hunting, collecting and exploitation of marine resources.



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