The site of Cap de Barbária II and the first human settlement of Formentera (Balearic Islands): Resource management and subsistence in a reduced insular environment


The site of Formentera, one of the smaller islands of the Balearic Islands, is one of the latest insular contexts to be occupied by human communities in the Mediterranean Sea. The current archaeological knowledge locates chronologically this first settlement during late Bronze Age (1500-1100 BC) in Calcolithic and Early Bronze Age societies (Mico, 2005; Alcover, 2005).

The open-air settlement of Cap de Barbária II is a unique evidence of a long human occupation in Formentera studied from a multidisciplinary perspective. It is the biggest village present in the island and offers a perfect opportunity to approach how these first settlers interact with a resource limited insular environment.

In the present paper we analyze the anthropic use of the environment by paying special attention to the exploitation of local and foreign resources. This in order to trace the first human impact from this insular settlement to the surrounding environment since then non-modified is obtained. Preliminary results point to a particular resource strategy in management different from the other contemporary Balearic archaeological contexts. The aim of this interaction with the environment by these first settlers was focused on diversification and intensification, in a context with both few local resources available and external contact.

**CAP DE BARBÁRIA II**

CBI is an open-air site located in Formentera (Balearic Island, Mediterranean Sea) (Figure 1) dated in the Fortified Settlements phase of the 2nd prehistoric sites identified in Cape Barbária. It is a central position among all the other sites and bigger dimensions with 9 different spatial contexts. Structures are defined by boat-shaped houses (naveform structures) a characteristic also found in other contemporary Balearic sites (Figure 2). CBI was excavated during the 70s and a new archaeological project has been developed since 2011.

**RESOURCE MANAGEMENT AND SUBSISTENCE IN CBI**

A multidisciplinary research is developed in order to approach how first settlers from CBI interacted with their environment. Specifically, our interest is focused on how they managed resources and developed their subsistence strategies.

**LITHICS**

Among lithic materials identified in CBI, both macro (Figure 3) and micro-tools (Figure 4), main prime resource used was from local origin. Nevertheless and as an exception, a very popular resource performed lithic tools were found. Several stone tools are found in CBI (Figure 1, 2, 3 and 5). These tools were used for archaeological purposes and woodworks. A flint was a highly appreciated raw-material, these tools were intensively used almost to the end of its useful life in all stages: analyses proved.

**ARCHAEOZOOLOGY**

Archaeozoological studies reveal a different subsistence strategy developed in Formentera compared to other contemporary Balearic sites. Although animals such as cattle (Bos Taurus), pigs (Sus domesticus) and goats or sheep (Capra/ovis) were exploited among others, mollusks are well represented both in number of remains and species (Figure 5). Exploited mollusks reveal exploitation related to consumption, but also to produce ornaments (Figure 6). Marine resources appear very important in CBI subsistence strategy.

**ARCHAEOBOTANY**

Archaeobotanical remains found in CBI reveal an exploitation of the trees close to the site, and an adapted diversified management of the planted resources (Figure 7). Archeozoological and pollen research is combined in order to study the environment. Therefore, we now know it was an open landscape predominated by Poso and Juniperus. Starch grain analysis has been also developed on carbonized remains. Imprints were also studied from different archeological objects from CBI (Figure 8). Thanks to that, we evidence presence of wheat (Triticum) and barley (Hordeum), but also millet and paria grass (Setaria/Panicum), better-adapted species to arid and dry soils.

**PETROLOGICAL ANALYSIS OF THE POTTERY**

The preliminary study undertakes through optical microscopy and thin section analysis allowed us to identify a main fabric within the ceramic assemblage of the site (Figure 9). The petrological composition suggests that ancient potters used the Limestone clay deposits that cover the Maóenie formations in Formentera. Specifically, the raw material can be related to devalued rich clays rich in silica that present in two deposits of certain importance in the area of Cape Barbária, both of them located at less than 100 m of the archeological sites of CBI. Furthermore, spathic calcareous intentionally added to the clay. This temper was probably obtained from calcareous formations, such as those existing along the coastline.

**ARCHAEO METALLURGY**

Metal remains recovered from CBI (copper and bronze with no mineral presence in both Formentera and Ibiza) are scars, as an example of the minimum contact developed beyond the island. They were used for the production of simple tools (such as punches and hooks) (Figure 11), and their scars presence in the archaeological record is probably related with an intense recycling activity. Nevertheless, the archeometallurgical study using X-ray fluorescence (XRF-ED), metallurgy (Figure 11) and lead isotope analysis (MC-ICP-MS) will allow us advancing in the knowledge we have related with elementary composition, internal microstructure and the probable origin.

**CONCLUSIONS: DIVERSIFICATION AND INTENSIFICATION**

Archaeological results allow approaching how humans interacted with the insular environment of Formentera and how their resource management and subsistence was developed during the Bronze Age. Results point towards a particular strategy that differ from the other contemporary Balearic insular contexts (Balears, Mallorca and Menorca). In Formentera, where a scarcity of resources was present due to environment conditions and isolation from Bronze Age trade nets, economic strategy developed is defined by diversification and intensification. An example of this is the unique exploitation of marine resources, local minerals to produce lithic tools and the intensive use of organic materials such as the bronze and flint tools.

Future studies will analyze particularities of such insular economy and the ecological impact that this economic strategy had on the environment.

**REFERENCES**
