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EARLY MODERN HUMANS AND THE MARINE ENVIRONMENT
[THE IBEROMAURUSIAN]

Article 8

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Abstract

The relationship of human and marine environments appear in many archaeological testimonies of prehistoric North Africa; this is seen especially in Algeria, one of the most important civilizations we find the Iberomaurusian. This paper aims to understand Iberomaurusian humans behavior in their environment and their relationship with the marine environment, therefore promoting underwater archaeological heritage. The coastal areas of North Africa have undergone major changes over time, which changed their appearance. Some of these changes include sea level fluctuations, during which sites that were established by the sea before the Holocene. These sites, like the Maghreb, bear witness to the relationship of the first inhabitants of the coast with the sea, and were submerged. Iberomaurusian is a prehistoric culture that dates back to the Upper Paleolithic, between 22 to 9.5 ka cal BP. It extends on the coasts of the Maghreb from northern Tunisia to southern Morocco, and housed Homo sapiens, who were genetically very close to Cro-Magnon. There are two groups of homo sapiens: Mecha-Afalou, the robust form, and Mechtoïd, the slender form. Coastal regions are rich in biomass and offer abundant and easily accessible food resources, and they were already, for this reason, attractive areas for the Iberomaurusian. Habitations of the Iberomaurusian concentrate on the coast where humans often settled in caves and rock shelters. Coastal borders of the Mediterranean provide, in particular, raw materials, offer mobility paths, strategic places to set up hunters-gatherers of the Late Pleistocene.

Keywords: Algeria, coastal borders, Iberomaurusian, marine environment, North Africa, subsistence.
I. INTRODUCTION

The coastal areas of North Africa have undergone major changes over time, which changed their appearance. For example, due to sea level fluctuations, settlement sites by the sea, which were established before the Holocene, were submerged like Tunisia. Moreover, the sea is an important source of nutrients. The closed Mediterranean basin does not present favorable conditions for the development of marine fauna, and according to biological and archaeological data, some fauna from prehistoric periods are identical to current fish and shells, which are contemporaneous to the Iberomaurusian culture. This research is aimed at investigating the relationship between the Iberomaurusian of North Africa and the marine environment. Our study is closely connected to maritime environments, and focuses on Iberomaurusian culture that often relied on coastal resources. This culture was involved in maritime activities such as fishing, collecting marine mollusks or shellfish harvesting. Iberomaurusian groups had navigation skills, and they fished sea bream that live in the coastal seabed. Until now, there is no clear evidence that shows that the Iberomaurusian of North Africa knew navigation outside of North Africa. Meanwhile in the Capsian, there is the presence of obsidian stone artifacts and striker reindeer wood. During the Neolithic period, the primary evidence that draws attention are archaeological remains, such as the remnants of printed and cardinal pottery, and the obsidian material that spread during the Neolithic period in the Tellian regions of the Maghreb. Probably, the obsidian was brought by Neolithic human groups to the Maghreb from Iberian Island (in the west) and from the islands of south Italy (in the east). The similarity in the remains distinguishes the neighboring countries of Egypt, Italy and Spain, which explains that there is a relationship among the prehistorical human groups. The essential arguments likely to prove the existence of any nautical activity in North African Prehistory comes from the marine environment. But we do have not direct evidence of preserved remains of boats or safe and well-dated iconographic representations.

The Iberomaurusian groups were hunter-gatherers. Also, they lived in diverse environments, both inland and along the coastal territories. We will, first of all, identify the different biotopes available, which were revealed by aquatic taxa from Algerian Iberomaurusian assemblages. It will thus be possible to determine the exploitation zones of these environments and to present examples of their exploitation. This study will be enriched by the examination of fish and mollusks remains from Iberomaurusian sites.

II. MATERIAL AND METHODS

Once aquatic territories are described, it is easier to estimate the type and degree of their exploitation by human communities, or in other words to outline the extent of human influence. It is obvious that the location of the sites in relation to the physical territories in question is not sufficient on its own to explain what is happening. We subsequently analyze and interpret human territories in a marine environment using GIS (Geographic Information Systems) as a tool. The approach, «Site catchment analysis», has been executed in this study, which focuses on hunter-gatherer economies and site resource bases for part of the Algerian region as a model. This approach relates

1 Onrubia-Pintato 2012: 1.
to the study of spatial connections in archaeology, and has usually been used in archaeological studies. This approach was founded by the researcher Chisholm and was developed by researchers Vita-Finzi and Higgs according to requirements and the special features of archaeology. They defined this theory as the study of the relationship between technology and those natural resources represented in the economic zone neighboring the site. GIS has become an efficient tool to implement predictive models and simulations in archaeology including the site catchment analysis.

We have explored ArcGIS for spatial repartition and analysis, and applied the buffer methods into main Iberomaurusian sites in this study in order to analyze the distance of Iberomaurusian sites from the seashore (near or far from archaeological sites). For the transportation of marine resources, we relied on «least-cost analysis» to reconstruct mobility patterns and procurement strategies for mollusks resources in west Algeria.

We used the data provided by the first authors and discoverers of Iberomaurusian sites, particularly for the marine remains of fish, mollusks and crustaceans. We have included our experiences in archaeological surveys of the Algerian coast, like Sidi Said, which is under the direction of Y. Saoudi and N. Saoudi in 2008. Our experience in archaeological excavations such as at Rachgoun site, which is under the direction of M. Betrouni in 2017, our moving from the Rachgoun site to the sea (Madrid Beach) by foot, helped us to understand the mobility of Iberomaurusian humans. Further, our visiting Taforalt and its surrounding area, such as Zegzel in 2019, during the First Congress of Geological and Archaeological Heritage (CPGA1, University Mouhamed Premier Oujda), has let us to know the territory of the iberomaurusian in this region of Morocco, this visit is under the direction of A. Bouzouggar and EL H. Talebi.

We use our study and analysis of Iberomaurusian stone artefacts of Taza I, and we exploited our analysis of prehistoric human settlement in the region of Taza I of Jijel in the Babors region.

III. IBEROMAURUSIAN CULTURE

Many researchers have been interested in the Iberomaurusian culture, which is a prehistorical culture belonging to the epipaleolithic. This culture was first named by Paul Pallary in 1909 after the tools that were found in La Mouillah, a site near

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3 Chisholm 1968: 113
4 Vita-Finzi & Higgs 1970: 5.
5 Savage 1991: 331
6 Such as Pallary, P. 1909; Barbin, P. 1910 & 1912; Cadena, P. 1948; Balout, L. 1958; Camps, G. 1974; Camps-Fabrer, E. 1975. In addition, we have included studies by recent authors: Campmas, E. et al 2016; Merzoug, S. 2017; Merzoug, S. et al 2022.
7 Chabane 2012: 281.
8 Chabane 2022: 925.
Maghnia west Algerian.\textsuperscript{10} He attributed the Ibero name to Spain, believing that it had cultural contact and communication with the Iberian Upper Paleolithic.

The \textit{Iberomaurusian} existed in North Africa during the Late Pleistocene, 22 and 9.5 ka cal BP.\textsuperscript{11} This period appears towards the end of the second Heinrich event and developed throughout the Late Glacial in Northern Europe. It correlates broadly with the northern European Younger Dryas. This Upper Paleolithic culture is mostly divided into two subphases: an Early and Late \textit{Iberomaurusian} \textsuperscript{12}. This period developed under a relatively cold and dry climate\textsuperscript{13}.

North Africa hosts numerous \textit{Iberomaurusian} sites [\textbf{FIGURE 1}]. Notable locations in Algeria include La Mouillah, Afalou Bou Rhummel, Taza, Zemmouri El Bahri, and Tamerhat, the oldest known site in Algeria\textsuperscript{14}. Additionally, El Ansor, dating back to 8100 BP (G1F.44.33), predates El Haouita, El Hamel, and Columnata. In Morocco, there are the following sites: Tafouralt, Harhoura, El Khenzira, and Ouchetata. There is also Hawa Fteeh in Tunisia, Hagfa Tira in Libya, and Nazlet Khater-4 in Egypt\textsuperscript{15}. Outside of Africa, there is the site of Ksar Akil in Lebanon, which is located near Beirut, in the layer (B3). It contains shells and microliths, dominated by backed bladelets\textsuperscript{16}.

\textbf{FIGURE 1}: Site distribution and land use of \textit{Iberomaurusian} in the Maghreb. CHABANE 2012: 15, FIG.1

During this period, \textit{Iberomaurusian} humans developed an industry characterized by distinctive bone and stone artifacts, setting them apart from previous periods. Paul Pallary defined the \textit{Iberomaurusian} stone artifacts as microlithic backed bladelet industry\textsuperscript{17} what spread along the coastal areas\textsuperscript{18}. To investigate the industrial complex of

\textsuperscript{11} CAMPAS et al. 2016: 83.
\textsuperscript{12} LINSTÄDTER 2008: 45.
\textsuperscript{13} MERZOUQ 2017: 190.
\textsuperscript{14} CLOSE 1984: 11-12.
\textsuperscript{15} VERMEERSCH et al. 1990: 444.
\textsuperscript{16} LUBELL 2004: 86.
\textsuperscript{17} BALLOUT 1958: 111.
\textsuperscript{18} BARTON et al. 2005: 79.
this culture, researcher Tixier provided a specific typological list in 1963, derived from the Maghreb region. This list, which includes 112 types distributed into 11 groups, serves as the primary model for attributing types within the Epipaleolithic period, to which the Iberomaurusian and Capsian cultures belong. An Iberomaurusian stone artifact is defined by its compact size and microlithic attributes, notably featuring crescent-backed bladelets along with larger-sized pieces.

Its main products are the bladelet lithic industry. Small cores allow for the production of bladelets, and are distinguished by a skewed flat striking platform such as what is seen in Taza I cave. These lithic cores are usually small pyramidal shapes. [Figures 2-3].

[FiguRe 2]: Iberomaurusian stone artifacts of Taza I site. CHABANE 2012: 15.

19 Roche 1963: 5.
In terms of debitage, the human maker prefers the extended shape because of their elegance and lightness\(^{22}\). In addition to the bladelets, we find blades and flakes. Stone tools are exceptionally rich and diversified, and this lithic industry contains a large percentage of backed bladelets tools [**FIGURE 4**]. The most notable one of backed bladelets tools is La Mouillah point\(^{23}\) and truncations tools which were made with the microburin technique. There is also an abundance of scrapers which mostly are flakes, denticulates, burins and micro geometrics that are rare\(^{24}\). The *Iberomaurusian* lithic industry characterized by the appearance of ouchtata retouche too\(^{25}\). Various raw materials are used including flint, sandstone and quartzite\(^{26}\). The *Iberomaurusian* lithic industry contains some sturdy tools such as hummer, grindinds or crushing tools, seen in the case of Dar-es-Soltan 2 site\(^{27}\).

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22 Gobert 1945: 448.
24 Schurmans et al. 2006: 12.
27 Nespolet & El Hadjraoui 2004: 89.
In addition, the presence of the bone industry among the Iberomaurusian is represented by bone tools and ornaments, which was identified by Camps-Fabrer in 1966. The bone industry contains only 27 of 54 types which are found in four groups. The first group is the cutter group, which were received in 06 types (slicers, knives and scissors). The second group include the polishers, the third group includes perceives and the forth group encompasses the ornaments, along with one type of pendant28.

Bone tools were made with varying degrees of mastery. Some of the tools discovered at the Afalou Bou Rhummel site showed masterful technique, while other tools were prepared by burning with less precision. It seems like the Afalou human did not care about the perfection of their manufacture, as they still preserve the anatomical parts of animal bone [FIGURE 5].

[FIGURE 5]: Iberomaurusian bone industry of Columnata site © Photo taken by the researcher

Iberomaurusian graves are available, sometimes forming cemeteries. The most famous cemetery is Columnata that presented 110 individuals. Taforalt had 183 individuals, while Afalou Bou Rhummel at least 60 individuals29. Furthermore Ifri n’Baroud is characterized by an individual burial30. Bodies are placed in a variety of positions, such as sitting cross-legged, on the back, or lying down such as in the case of H28 of at Afalou Bou Rhummel. The squatting position is also observed at the Taforalt site. Funeral rituals were associated with some buried bodies (animal remains, body adornment, stone or bone tools and pieces of red ocher). Iberomaurusian inhabitants practiced tooth avulsion, or the removal of the upper incisors. This ritual is applied to the two upper incisors.31This phenomenon was practiced whether female or male32, teenager or child. The lower incisors were removed even if they are not used regularly33. The concept of practicing this ritual remains ambiguous.

29 HACHI 2006: 430.
31 CAMPS 1974: 97.
32 NESPOULET & El HAJRAOUI 2004: 89.
33 HADJOUIS 2002: 338
Iberomaurusian made art throughout North Africa, which is characterized by small figurines made of pottery (baked clay). The Tamar Hat cave has many of these artistic examples. At this site, a piece of baked clay, dated to 20200 BP, was found and published by Saxon in 1973. The site also yielded two spherical sandstone pebbles, which were perforated and of large size. Similarly, Afalou Bou Rhummel is a site that contains the largest collection of objects made of pottery, some of which are piles of clay including spherical and sub-spherical shapes, but the majority of the clay pieces represent animal shapes and Anthropique shapes. Statues of Afalou Bou Rhummel concentrated in the layer VIII and IV, dated between 14910 ± 180 BP and 13120 ± 370 BP.

IV. IBEROMAURUSIAN HUMAN

The aterian human being disappears and the Mechta Afalou human type appears in the Iberomaurusian record. The name Mechta Afalou is derived from Mechta El Arbi, the archaeological site where Mercier & Debruge (1907, 1912, 1914) found the first representative of this human gendre, and Afalou Bou Rhummel, the site where a large number of human skeletons were found and allowed for Vallois & Boule to identify more Mechta Afalou. This is a true homo sapiens, very close in shape and appearance to the cro-magnon, who appeared in Europe about 35000 years ago.

There are two groups: the Mechta Afalou, who have a rough appearance, and the Mechtoïd, who have a thin appearance or body. The available evidence suggests that they were anatomically modern Homo sapiens, more than 500 individuals were found. According to Chamla, this human type contains the following physiological characteristics: A man’s stature is estimated at 1.74 m and that of the woman is 1.63 m with a brain capacity estimated at 1650 cm³. The skull has a pentagonal shape from the upper view, and is long dolichocephal, mesocephal and disproportionate to the face. The facial shape is low, short, broad and generally thrust forward with a prominent nose. The orbits are far apart and have a rectangular shape, lowered and the lower jaw is sturdy.

The skeleton is rough and the bones are thick. The forearms and feet are long comparing to the humerus and thigh. Chamla showed that the Mechta Afalou species combines four subspecies, forming the evolution connections of this species. The oldest type has the longest «hyperdolicocephal» skull, which is seen in number 38 from Afalou Bou Rhummel. The Classical is characterized by long and a medium skulls, dolichocephal and mesocephal, which we find in Afalou Bou Rhummel and Taforalt.

34 Camps-Fabrèr 1960: 105.
36 Hachi 2006: 431.
38 Arambour et al.1934: 64
40 Irish 2000: 393.
The evolved iberomaurusian is known as Mechtoïd and has a less robust skull and small dimensions; this kind is found in Taforalt, Afalou Bou Rhummel and Columnata. The last type has a short skull, which correlates with brachycephal, is known in north Africa; it is autochthon and characterized by its slender shape. This type evolved locally and has been identified in Afalou Bou Rhummel and Columnata [Figure 6].

[Figure 6]: Human Nº.22 from the Columnata necropolis. CHAMLA 1994: 6. Modified by the researcher

V. HABITAT

Coastal regions are rich in biomass and offer abundant and easily accessible food resources. They were already, for this reason, attractive areas for the first hominids in different parts of the world\textsuperscript{43}. The iberomaurusian almost completely occupied the coast\textsuperscript{44}, occupying caves and deep rockshelters. We also sometimes find them in exposed habitats. Mostly, they are common in sandy regions or territories which Balout spoke about «law of the sands»\textsuperscript{45}, like in fixed dunes.\textsuperscript{46} Such sites include Rachgoun, El Khir and Ouchtata. Or they live on stands of erosion, such as Le Musoir site, Courbet-Marine (the new noun is Zemmouri El Bahri), Demnet El Hassan and El Ksar site, cut out of alluvium where sand dominates. These habitats were built and shaped with branches and reeds, having left no visible structures in the archaeological layers\textsuperscript{47}. The thickness of archaeological layers in certain rockshelters and caves (Tamar Hat, Taforalt, Ténès, Taza I) reveals the sustainability of the occupation, which is confirmed, in at least three cases, in Taforalt, Afalou bou Rhummel and Haou Fteah. This is a chronological sequence covering several millenaries. On the basis of the large size of the sites, the depth of the deposits and the large number of burials discovered in certain sites, it seems that the iberomaurusian lived in large groups. At least a few sites functioned like base campsites\textsuperscript{48}. There are also sites that are interpreted as seasonal fishing stations, such as cave of Taza I\textsuperscript{49}.

\textsuperscript{43} ALVAREZ-FERNANDEZ 2015: 192.
\textsuperscript{44} CAMPS 1974: 59.
\textsuperscript{45} BALOUT 1955: 347.
\textsuperscript{46} BARICHE et al. 2006: 568.
\textsuperscript{47} CAMPS 1974: 91.
\textsuperscript{48} LUBELL 2005: 210; CAMPS 1974: 92.
\textsuperscript{49} MERZOUG et al. 2022: 101.
VI. THE RELATIONSHIP BETWEEN HUMAN IBEROMAURUSIAN AND THE MARINE TERRITORIES

Whenever the region and aquatic environment (continental or marine) is concerned, the examination of prehistoric navigations poses a certain number of methodological issues that must be taken into account\(^{50}\). Aquatic remains are collected and studied in archaeological sites. The evidence suggests that, during the Iberomaurusian period at the coastal sites, hunter-gatherers used several marine vertebrates and invertebrates. These include bones and otoliths bony fish, calcified vertebrae and teeth of cartilaginous fish like sharks (Abri Alain site)\(^{51}\). There are also mollusk shells at Taza I site and Columnata. The hard parts of crustaceans, sea urchins, and the bones of marine mammals at places such as anatidae in Abri Alain site\(^{52}\) generally indicates that humans introduced these organisms into a land territory.

Iberomaurusian groups used marine shells at Afalou Bou Rhummel and champlain at Blida\(^{53}\) (Algeria), Ifri el Baroud and Ifri n’Ammar\(^{54}\) (Morocco). Archaeological shells contributed both to diet and manufacture, such as making ornaments [FIGURE 7]. Marine mollusks give us access to the environments exploited by these Iberomaurusian populations and their movements and their relationship with the sea.

\[\text{FIGURE 7]: Mollusc shells from TAZA I. A. Cymbula safiana; B. Patella rustica; C. Patella ferruginea; D. Patella caerulea; E. Phorcus turbinatus; F. Columbella rustica; G. Stramonita haemastoma; H. Mytilus edulis; I. Glycymeris nummaria; J. Cerastoderma edule.}\]

MERZOUG et al. 2022: 104, FIG.4

\(^{50}\) ONRUBIA-PINTADO 2012: 1.

\(^{51}\) CAMPMAS et al. 2016: 90.

\(^{52}\) CHIBANE 2016 : 31

\(^{53}\) BALOUT 1958: 121.

\(^{54}\) NAMI 2011: 264.
1. Dietary Behavior of Iberomaurusian Humans through Aquatic Remains

The *Iberomaurusian* groups were accustomed to using the resources of the Mediterranean and Atlantic, mainly mollusks, crustaceans and fish. In complementary sites where shellfish constituted a part of the diet, the piles of shells provide us with a great deal of information about the human who occupied them. The piles of shells report sites that were only occupied in certain seasons and usually show evidence of specialized economic activity, such as fishing. «Shells, through the richness of their colors and the brilliance of their pearl, very early on exerted a great attraction for the prehistoric human of North Africa, as elsewhere. Iberomaurusians and Capsians who mainly fed on the product of their harvest and collecting marine shells, or land snails have obviously sought among these elements of their diet a good part of their objects of ornament».55. Sometimes, marine mollusks, some of which served as objects of adornment, are most common; those that were used for food, seen at the Abri Alain site, for instance, are the rarest56. The hunting of terrestrial animals leaves several archaeological remains, in the form of animal bones, microlithic tools and weapons, and other technologies. Fishing and related activities leave less. *Iberomaurusian* inhabitants generally had at their disposal territories and aquatic fauna quite comparable to those currently observable. However, fauna was probably exploited differentially depending on fishing and gathering techniques, the individualities of production, consumption and habits, or subsistence behaviors. We can note this in the Taza I and Abri Alain sites [FIGURE 8] according to studies carried out by Campmas and al. in 2016, Merzoug S. in 2017 and Merzoug S. and al. in 2022.

![Graph curves show majorities. Taxa that identified in Taza I and Abri Alain sites](image)

Shells and shells have helped to understand the activities and behaviors of *Iberomaurusian* groups. Depending on whether man sought the raw material that is the shell or the flesh of the animal, the methods of supply may have varied. The marine shellfish and shell have a privileged place in the daily life of the populations who

occupied the sites (rock shelters or open-air sites), whether they are coastal or more than 100 km away from the Iberomaurusian coastline.

Groups stayed on the coast and hunted mammals, seabirds (anatidae)\textsuperscript{57} and consumed the shells that eventually created the shell middens. Fish certainly constituted the bulk of the diet. We find this type of remains in most coastal sites that indicate human consumption. Among the remains are fish vertebrae or bone pieces, which are numerous at Abri Alain (Alain rockshelter)\textsuperscript{58}. Marine taxa in the Iberomaurusian sites are labridea, Sparidae which revealed the presence of royal sea bream in Taza I\textsuperscript{59}; this indicates that prehistorical humans practiced marine fishing\textsuperscript{60}. Iberomaurusian flint artifacts are used for marine fishing. They have regular geometric shapes, such as a trapezoids and triangles that have refined edges, including those found in (Taza cave, La Mouillah, Abri Alain, Sidi Said, Rassel, Taforalt, Temara and Ghar Cahal...). The piece is attached to the end of the stick with a barb for hunting. It is probable that the Iberomaurusian used the bone tools for fishing: straight hooks, assegais and harpoons, the latter type is the only fragment of a harpoon with a row of bone barbs collected in level III of Taforalt\textsuperscript{61}. The bone hooks found in Iberomaurusian sites are well made. Fish vertebrae are very often found at coastal sites, indicating that fish were a source of food, along with marine mollusks.

Among the sources of food for the humans in the coastal region are marine mollusks that one can pick up from the sea and ocean, and other shellfish. Through this type of activity, one can identify an aspect of food selection during the Iberomaurusian in the coastal areas of the Mediterranean and Atlantic. Among the species that have been consumed by Iberomaurusian humans are Mytilidae, Patellidae, Trochidae, which are found in a rocky biotope in the intertidal zone. They were probably collected at low tide\textsuperscript{62}, making them easy to locate and collect on emerged rocky substrates. These families are represented in the Mediterranean (Abri Alain, Taza, Tamar Hat, Afalou Bou Rhummel). Similarly, they are found on the Moroccan Atlantic coasts (Temara-Rabat) which is defined as the Middle Stone Age in North Africa\textsuperscript{63}. Likewise for Pattelidae which are widespread in the Iberomaurusian sites of the Mediterranean coast\textsuperscript{64}, for example at Rassel site C. Brahim in 1970 noted the presence of Torchidae and Patellidae which are in the Babors region, such as Afalou Bou Rhummel, Tamr Hat and Taza I cave and in the Oranais region too (Abri Alain)\textsuperscript{65}. According to P.BARBIN in 1910, there are Cypraea lurida shells that were extracted in 1907 in La Mouillah, which was discovered in 1899 by P.PALLARY\textsuperscript{66}. Mytilidae, Patellidae, Trochidae are found at

\textsuperscript{57} CAMPMAS et al. 2016: 97.
\textsuperscript{58} CAMPS 1974: 94; CAMPMAS et al. 2016: 11.
\textsuperscript{59} MERZOUG et al. 2022: 102.
\textsuperscript{60} CAMPS 1998: 83.
\textsuperscript{61} CAMPS 1974: 67.
\textsuperscript{63} STEELE & ALVAREZ-FERNANDEZ 2011-2012; CAMPMAS et al. 2016: 97
\textsuperscript{64} CAMPS FABRER 1994: 02.
\textsuperscript{66} BALOUT 1958: 113.
Temara in the Moroccan Atlantic (la grotte des Contrebandiers). The Iberomaurusian groups mainly ate Mytilidae and Patellidae, but also to a lesser extent Trochidae and Muricidae. With regard to mollusks, Arambourg noticed a difference in the consumption of their strains. For example, in the upper stratigraphic level of the Afalou Bou Rhummel and Tamar Hat sites, he noticed a large spread of marine shells compared to the lower level with upper level.

Archaeological and ethnographic data indicate that the first species caught or collected were probably accessible at the waterline or slightly below, without requiring large technical investments: hand fishing or use of knives made of stone, bladelets or hooks sufficed. The notches on the Patellidae shells indicated that they were adapted to ol's, which would allow one to slide between the shell and the rock to detach a mollusk from the rocky substratum. In this way, the collection of coastal invertebrates is attested in the Iberomaurusian levels of North Africa.

It is noted that the exploitation of other fishing resources by the Iberomaurusian inhabitants are crustaces, and Crab clips (Afalou Bou Rhummel and Taza I cave). Also, the human groups of this period exploited sea urchins at Abri Alain, Taza I and Rachgoun. There are some fishing resources not identified in the ancient assemblage, including (Aterian and Mousterian), Haliotis (Contrebondiers site) and (Dar es Soltane site). Also, the crab claws were found in the Iberomaurusian, but not in the oldest assemblage, despite the robustness of these fossils. It was found in the most recent material from the Haou Fteah site too, but not in Late Pleistocene material.

Apparently, Invertebrates and Crustaces are not the main food of the Iberomaurusian groups, but were supplements to the meat they got from the animals they hunted. Iberomaurusian groups have also collected marine shells or mollusks for other uses such as body adornment.

Body Adornment Marine Remains

Iberomaurusian human groupes mainly feasted on their harvest and collected marine shells and fish. They also used marine shells as body adornment. Many Iberomaurusian sites suggest that marine mollusks were used as body adornments along the Atlantic coast (Temara, Bouskoura, El Khenzira, Dar es Soltane) and the Mediterranean coast, including sites such as Rachgoun, Rassel, Tamar Hat, Afalou Bou Rhummel, Taza, and Ouchtata.

Marine shells were an important feature in the spiritual life of Iberomaurusian inhabitants, and were used as symbolic expression. For example at La Mouillah site, the Cypraea Lurida seemed to have been burned, and the human skeletons discovered in a...
rock shelter there was found wearing a marine shell of this type as a necklace. The Iberomaurusian people at Abri Alain in the Oranean and Taza I in the Babors region adorned themselves with shells, primarily using tusk shells (Dentaliidae), Glycymerididae, Cardiidae, and Turritellidae, all of which are still commonly found in the Mediterranean Sea. At Taforalt, the majority of the marine shells that were used for bodily adornment were sea scallop, turrets, and dentales.77 Among the scaphopods, tusk-shell (Dentaliidae) are very common at the Iberomaurusian sites in the Maghreb, and are especially common during the Neolithic era.78 Marine and land mollusks of various types have been used by humans since the Iberomaurusian period at coastal sites. Even to this day, in this region, people use them to adorn their bodies.

77 CAMPS 1974: 94.

[FIGURE 9]: Marine shells as body adornment. CAMPMAS et al. 2016: 92, 94-95. Modified by the researcher.
2. The Marine Territory of the *Iberomaurusian* Fisherman

A coastal territory is an area defined as an ecotone, or a region of transition between two terrestrial and marine biomes\(^\text{79}\). The *Iberomaurusian* culture spread throughout all of the coastal regions of the Maghreb, starting from the Libyan coast in the east to the Atlantic Ocean in the west. The specific regions include Libya, Tunisia, Algeria and Morocco, with the exception of the eastern Tunisian coast, because the geological formations dating back to this period are currently submerged under the Mediterranean Sea, several kilometers off the current coastline, which is particularly low\(^\text{80}\). This culture also extends to inland regions such as the high plateau (Hauts Plateaux) in Algeria and the middle Atlas in Morocco [FIGURE 11].

\(^{80}\) CAMPS 1974: 61-62.
The coastal zone was an important territory during the *Iberomaurusian* period when hunting and fishing were the main activities. The proximity of the aquatic territory with the land makes it more easily accessible by humans and can contain various substrates: rocky, sandy or sludgy. Each marine organism is dependent on a type of substrate. By cross-referencing data on archaeological taxa habitats with the specific geomorphological conditions to each region, we can determine the exploited coastlines, evaluate the distances covered to procure resources, and understand how populations strategized to collect such resources.

We took as a case of study the Algerian *Iberomaurusian* sites that cover this period and which effectively demonstrated the relationship between the *Iberomaurusian* human and the marine territories. We tried to use site catchment analysis, which is used to study ancient hunter-gatherer mobility and subsistence. Researchers conducted experimental studies to test the theory of site catchment analysis, focusing particularly on how human groups move around sites of activity. They concluded that moving in an uninhabited area requires great effort. In order to procure natural resources that are necessary for living, populations needed to be able to exploit neighboring areas, especially when they reached the point of sufficiency\(^81\). In most of the cases studied, the distances walked was less than 10 km.

We applied the buffer methods with ArcGIS into 03 main *Iberomaurusian* sites as a model in this study (Taza I, Abri Alain and Columnata) and other sites of this period. As a result, we conclude two groups of sites, the first group is near the coastline and the second group is far from the coastline. Sites close to the sea for example, Sidi Saïd, in Algeria was partly submerged in the sea [FIGURE 12], along with Temara, Morocco. There were also sites that were distant from the maritime territories. It seems that the *Iberomaurusian* inhabited the area along the seashore, less than 500 m away. Such areas of inhabitation include Taza I cave of Jijel (Algeria) and Kef El Hemmar (Morocco). These populations consumed the fish and marine mollusks, and collected marine shells from rocky substrates near the site. Additionally, the Abri Alain rock shelter of Oran is located in a wetland less than 5 km from the seashore. The Oranean region is considered to be one of the oldest regions where prehistoric people used maritime navigation. The same distances are noted between sites and the coast in Morocco, such as Hattab II site, Cap Ghir site, El Khenzira and Temara in Moroccan Atlantic. The *Iberomaurusian* human settlement was primarily concentrated along the coastline, influenced significantly by the availability of key natural resources, particularly those related to nutrition. There is distance between the settlement location and these vital resources.

*Iberomaurusian* human groups who frequented habitats located near the sea were familiar the marine world, which is clear according to the archaeological remains found in the sites. It is obvious that aquatic fauna was an integral part of the diet and daily life of the *Iberomaurusian*.

![Image](image_url)

[FIGURE 12]: The aterian/ *Iberomaurusian* Sidi Saïd site. BERTROUNI 2021: FIG.8

The exploitation of marine fish and shells are evidenced in the inland territories through the remains of marine mollusks found at Columnata. Rare dentalium shells and cardium valves that are pierced with suspension holes indicate possible interaction with inhabitants of the coastal areas. The buffer shows a distance less than 150 km from the coastline [FIGURE 13], which indicates that the *Iberomaurusian* exploited the maritime environment in this site. Furthermore, this population used inland fish and mollusks, whereas in the inland sites, they only transported mollusks. As we have seen, they more systematically exploited nearby territories, rivers and lakes. However,

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82 CAMP 1974: 275.
83 SARI 2023: 74.
southern populations, (Hauts Plateaux) also sometimes exploited coastal resources (Columnata site in Algeria and Kifan Bel Ghomari in Morocco), despite their distance. Examination of the faunal remains revealed less exploitation of these resources for consumption. On the other hand, this supply, which were mostly mollusks, seems to have served other purposes, such as the production of ornaments and utility objects. In other words, the way these remote territories exploited marine fauna was not to meet daily needs, but seems to be more selective.

[FIGURE 13]: Application of a buffer with SRTM into main Iberomaurusian coastal sites and marine territories of Algeria © Done by the researcher

Probably, links between these Iberomaurusian sites allowed natural resources such as marine mollusks to be transported. The accessibility of sites is a determining criterion, and calculating the average of the two least-cost distances between two locations, measures the number of paths that served these human settlements. This allows for the analysis of exchange networks and circulation paths between archaeological sites. As a result, we apply, in this case, «least-cost analysis», to reconstruct possible ancient paths between sites of human activity and sites catchments.

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(molluscs resources) in west Algeria. Three Iberomaurusian sites (Columnata, Abri Alain, and Cap Ténès) were selected as proxies to delineate the least-cost paths for the movements toward natural sources of marine fish and mollusks [FIGURE 14/A]. Then, the least-cost path 1 is between Abri Alain and Columnata site, with a distance of 180 km; the Iberomaurusian would have walked more than 36 hours to take raw material or natural resource. The least-cost path 2 is between cap Ténès site and Columnata site, or a distance of 207 km, which is the equivalent of a 41 hours walk. The distance between the coastline to Columnata is 118 km. In Morocco, from the distance between the Mediterranean coastline to Kifan Bel Ghomari, which is situated in eastern Morocco at foothills of the middle Atlas\(^{85}\), is 163 km (Kifan Bel Ghomari to Hattab II). From the Atlantic to Kifan Bel Gohmari, the distance is more than 206 km (Kifan Bel Ghomari to Temara) [FIGURE 14/b]. The surrounding area of the catchment base in Kifan Bel Ghomari site is larger than at Columnata. On average, a prehistoric human could only walk 10 km a day. To move to the sea the human needs other encampments, which means there are probably others sites in these regions.

[FIGURE 14]: The accessibility of sites and mobility © Done by the researcher

\(^{85}\) Roubet & Hachi 2005: 1.
VII. CONCLUSION

The study of Iberomaurusian’s relationship with the marine world proves interesting. This study suggests that there was a critical juncture for Iberomaurusian humans, wherein they needed to break away from their inland territory and explore a previously unfamiliar marine environment. Food was acquired through hunting and gathering. Iberomaurusian humans also liked to collect shellfish, and probably fished. Archaeological remains indicate that both marine and terrestrial food resources are exploited.

The marine remains were primarily across the coastline and extended inland (more than 200 Km from the coastline), with marine shells being found at Columnata, in the Tiaret’s Mountains (Algeria) and at Kifan Bel Ghomari (Morocco). Aquatic or marine resources, however, remain a small portion of the fauna exploited, even when compared to the terrestrial resources, particularly mammals. The evidence suggests that, during the Iberomaurusian, hunter-gatherers at the coastal sites used several marine vertebrates (fish and seabirds) and invertebrates (marine mollusks) as subsistence. However at sites far away from the Atlantic and Mediterranean coast, hunter-gatherers only carried marine mollusks such as dentaliidae.

It’s plausible that the Iberomaurusian people occupied open-air sites instead of rock shelters, unlike the Aterian culture, and migrated closer to the coastline. This trend is evident not only in the Temara area, which is currently submerged in the Moroccan Atlantic, but also in regions of Algeria and Tunisia. Verification of this hypothesis would require the development of underwater archaeological techniques to explore submerged sites. It is necessary to do inventories, surveys, and explorations of submerged prehistoric sites, particularly of the Iberomaurusian sites off the coasts of North Africa. This effort allows us to understand human’s behavior in their environment, and highlights the importance of underwater archaeological heritage.
BIBLIOGRAPHY


MERZoug, S.: «Subsistence Behaviors in Northwest Africa During the Late Pleistocene/Holocene transition: Between Homogeneity and Strategic Variations», Lanthropologie 121, 2017,189-203.


PALLARY, P.: l’Abri Alain près d’Oran (Algérie), Mém.12, Paris (M ASSON) 1934.


