

The Exploitation of the marine environment by the ancient population of Caesarea through mosaics.

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Abstract:

This article aims to study the exploitation of marine resources in ancient Caesarea through the analysis of mosaic representations reflecting the relationship between humans and the sea. The research seeks to highlight the diversity of marine species depicted in mosaics and their symbolic and cultural significance, demonstrating the inhabitants' awareness of the sea's essential role in their lives. It also aims to identify the fishing techniques employed by the ancient population, based on visual scenes illustrating methods similar to those attested in other regions of ancient Algeria. Finally, the article examines the processing, preservation, and distribution of marine products, in order to understand the economic system built around the exploitation of these resources, emphasizing their vital role in the city's social and economic life.

Keywords: Environment; Marine; Exploitation; Caesarea; Mosaic.

Introduction:

In antiquity, the sea held a central place in the lives of societies, which skillfully used its resources to meet their needs. It provided natural wealth such as different species of

marine animals and salt, the latter being especially important for food preservation and other uses. The ancient population of Caesarea drew on the sea both as a source of nourishment and as the basis of economic activities, while also incorporating it into their cultural expressions and beliefs.

Caesarea (present-day Cherchell), a coastal city and capital of the province of Mauretania Caesariensis, was first established as a hub of commercial exchange between the Phoenicians and local populations. Over time, it became a Punic city through intermarriage between these communities. The city grew significantly under King Juba II, eventually developing into a Roman city.

The aim of this article is to examine how the ancient population of Caesarea and its surrounding region made use of the sea. Marine products played an essential role in their diet and show the close relationship between the sea and the food practices of the period. This leads us to the following questions what do the mosaics reveal about marine resources and their exploitation by the population of Caesarea in antiquity?

1- A Geographical and Historical Overview of the City of Caesarea (Cherchell):

The city of Iol or Caesarea is an important coastal city located about 100 km west of Icosium and 27 km west of the city of Tipaza. It is bordered to the north by the Mediterranean Sea and to the west by the city of Gouraya, formerly known as Gunugu.

The city was initially a center and station for trade between the Phoenicians and the indigenous population. Over time, it became a commercial port frequented by merchants and sailors, which contributed to its development into the Punic city known as «Iol» (Gsell, 1952, p. 120). Many archaeological finds dating back to this period have been uncovered there, some of which date back to the 5th century BC. During excavations carried out in the forum, various

Punic remains were found under the Severan paving, including pottery, lamps, and other discoveries, but no visible traces of the Punic city itself remain (Benseddik et Ferdi et Leveau, 1983, pp. 8-9).

The city later became the capital of the Roman province of Mauretania Caesarea, and its name was changed from Iol to Caesarea. The city underwent rapid and significant urban expansion, becoming one of the most densely populated cities in North Africa after Carthage, as well as one of the richest cities in the region. This prosperity was achieved during the reign of the Numidian king Juba 2, who worked to spread culture and the arts, and changed the name of the city from Iol to Caesarea in honor of Julius Caesar. During his reign, the city underwent remarkable development, as it was surrounded by a wall covering an area of approximately 370 hectares (Leveau, 1984, p. 79) to protect it and its inhabitants, making it a fortified city that enjoyed strength and immunity (Salama, 1988, pp. 256-257).

The Kingdom of Mauretania Caesarea province was annexed to the Roman Empire after 40 AD, following the assassination of King Ptolemy (King of Mauretania and son of Juba II), its last king. This annexation took place during the reign of Emperor Claudius, who succeeded Emperor Caligula and ruled between 41 and 54 AD (Cheniti, 1982, p. 77). During his reign, Caesarea was designated a Roman colony, confirming its continued role as the capital of the province, and the province of Caesarea was established in 42 AD (Touahri, 2014, p. 31). During this period, the city underwent major developments, including the construction of many landmarks, the restoration of others, and extensive expansion, particularly with regard to public landmarks. The city was also famous for trade and navigation, and had the second largest port in North Africa after Carthage (Duval, 1946, p. 150).

By the 4th century AD, the city had been destroyed as a result of the attacks of the Visigoths on the province, which

left it burned and ruined (Duval, 1946, pp. 150). The city was later rebuilt by Emperor Theodosius between 420 and 430 AD, coinciding with the arrival of St. Augustine and his speech against the Donatists (Lepelley, 1981, p. 519). In 455 AD, Caesarea fell to the Vandals. As for the Byzantine occupation, very little is known about it. The Byzantines captured the city in 534 AD, but they were unable to control the local tribes scattered throughout the province, which limited their ability to establish a strong presence in the city (Duval, 1917, p. 164).

2- Marine resources represented on the mosaics:

Archaeological discoveries, especially ancient mosaics, provide valuable depictions of the marine environment. These artworks not only show the diversity of the underwater world but also emphasize the essential role the sea played in ancient societies, both economically and symbolically. Among the most important examples are the following:

2.1. Mosaic of Marine Animals:

Outside the modern city, to the left when leaving through the gate of Ténès in the western part of ancient Caesarea, a settler named M. Waille spent years extracting fine building stones. He reported encountering a large mosaic-paved room. One of the mosaics, executed more roughly, depicts a scene of marine animals (Gsell, 1901, pp. 190-191) within a structure that has not been clearly identified. Later excavations revealed a semicircular basin in which a mosaic was found covering it in 1895 (Ferdin, 2005, p. 133-136). The mosaic shows various marine animals, including eels, shellfish, a starfish, a seahorse, a dolphin, and others. Fish are the most numerous in the composition, depicted in different sizes, shapes, and colors-grey, white, and orange, some display decorative patterns on their scales, arranged throughout the center and along the edges of the mosaic (Gsell, 1901, pp. 190-191).

The sea bream appears several times, distinguished by its elongated, slender body, brown and orange hues with touches of white and black, and a clearly defined head.

The eels: The center and the corners of the mosaic also revealed eels which are shown with long, flexible bodies that suggest activity and movement. Their colors range from grey to brown with occasional black details. These figures can be seen in the center and corners of the mosaic.

The dolphin, on the left side of the mosaic, is rendered with a fluid, graceful form. Its colors combine grey, white, black, and brown, with fine details emphasizing its contours.

The lobster, on the right side of the mosaic, is recognizable by its claws and segmented limbs. Its coloring is a mix of orange and light brown, with darker patterns accentuating the structure of its carapace.

The seashells, scattered across the entire surface of the mosaic, serve either as background elements or as integrated parts of the animal composition. They show rounded forms and colors ranging from white and beige to black and gold.

The hippocamp (seahorse), a mythological creature often depicted as a hybrid between a horse (or dog) and a fish, is shown in a palette of green, light brown, and black, the latter used to define its outlines.

The sea urchins, placed throughout the mosaic, are portrayed in shades of light brown, dark brown, and black. Their forms are round or spherical, with spines projecting outward.

The starfish, at the center and right side of the mosaic, are shown with multiple arms and concentric motifs at their cores. Their colors are mainly white, with slight touches of yellow or gold.



Image No. 01. Mosaic of Marine Animals (The author)

2.2. Mosaics from the House of the Two Basins:

In January 1940, excavations were carried out at the House of the Two Basins, located on the boundary between military grounds and the former Jouvain estate. The site contained nymphaea decorated with mosaics. The excavations mainly revealed a hydraulic complex along with the remains of a residence arranged around a peristyle, separated by a decumanus (Ferdi, 2005, pp. 175-176).

2.3. The Mosaic of Ulysses and the Two Sirens:

The floor of the basin depicts the sea along with other motifs, while the walls show an episode from the *Odyssey*. Among the marine creatures represented are three dolphins, seashells, and a whelk (*buccinum*).

The Dolphins: Three dolphins appear in this mosaic. The first is on the right, the second on the left, and the third in the center. They are shown in bluish-grey tones with lighter highlights. Their fins are clearly defined, with pointed snouts and fan-shaped tails. The central dolphin seems to move toward the ship, while the one on the left swims toward the center of the scene.

The Seashells: Scattered across the surface of the mosaic, the shells are elongated or oval in shape, rendered in light tones such as beige, white, and shades of brown.

The Whelk: A spiral-shaped whelk appears in front of the third dolphin. It is shown in beige, white, and yellow hues, accented with brown tones.



Image No. 02. Mosaic of Ulysses and the Two Sirens (The author).

2.4. Mosaic of the Triumph of Neptune:

This mosaic was discovered under the same conditions as the previous one. It has a similar shape, differing only slightly in size, and is comparable in both technique and materials. The mosaic depicts a mythological scene featuring the god Neptune, together with two dolphins

Neptune occupies the central position, dominating the composition. He is shown nude, with long curly hair, wearing a crown, and holding a trident. The tesserae used for his body are mainly light beige and white, with darker tones highlighting certain details.

The mosaic includes two dolphins, depicted in blue and gray tones with white highlights, characterized by elongated bodies, pronounced dorsal fins, and fan-shaped tails.



Image No. 03. Mosaic of the Triumph of Neptune (The author).

2.5. Mosaic of the Toilet of Venus:

This mosaic was discovered in 1958 in the western house of the Tennis Club, located beyond the gate of the modern city, north of today's Daïra gardens. During construction work for a new tennis court, the remains of two separate buildings were uncovered. Both were bordered to the north by a paved decumanus and divided from one another by a shared wall (Ferdì, 2005, p. 94).

The scene shows Venus, seated in a green shell carried by two centaurs, emerging against a dark marine background. She holds a golden necklace set with jewels and is partially draped, while the centaurs frame her symmetrically. Two Nereids ride sea monsters, adorned with jewels and flowing scarves. The mosaic portrays a sea full of life, populated by numerous fish and dolphins. Their animated presence enlivens the scene and underscores the abundance of the marine world depicted (Ferdì, 2005, p. 98).



Image No. 04. Mosaic of the Toilet of Venus (Ferdì, 2005, p. 291).

2.6. The Fisherman Mosaic:

This mosaic was discovered in the Volto estate house, located south of the national road. Excavations were first carried out by Waille in 1902–1903, who uncovered a large hall paved with mosaic, and later by Glénat between 1921 and 1923 (Ferdì, 2005, p. 144). More precisely, the mosaic was found in the

latrines adjoining the previously excavated hall, separated from it by a thick masonry wall (Ferdì, 2005, p. 147).

The scene depicted is most likely related to fishing. It shows a male figure standing, dressed in a short light-gray loincloth tied at the waist. In his right hand, he holds a long light-brown tool, while his left hand is raised, possibly toward a fish.



Image No. 05. Fisherman Mosaic (The author)

3- Practices of Marine Exploitation:

Fishing-related activities were undoubtedly important in Caesarea. The rocky coastline was rich in fish, and its fisheries were highly valued. However, the mosaics uncovered do not directly represent the exploitation of marine resources; rather, they illustrate its results. By contrast, other archaeological sites in Algeria have yielded significant mosaics depicting various forms of marine resource exploitation, especially fishing.

Fishing was an essential activity for the population of Caesarea. As a coastal city, it played a central role in daily life. Among the archaeological remains that attest to this practice are mosaics, which serve as artistic witnesses to the activity and provide valuable insight into fishing techniques as well as their social, economic, and symbolic significance. These representations make it possible to identify different types of fishing and to appreciate their diversity.

3.1. Net Fishing:

Net fishing was one of the ancient techniques used to catch fish with a large net, usually deployed from a boat. This method allowed the capture of a larger number of fish at once.

The first mosaic, discovered at Hippo Regius (modern Annaba) (Image No. 06), shows a boat with three fishermen in short tunics, each holding a fishing net. Several marine creatures appear around the boat-some on the surface of the water, others seemingly caught in the net. Among the species represented are a dolphin, a ray or jellyfish, squid or cuttlefish, a mullet, a sea bream, and possibly a moray eel.

The second mosaic, unearthed at Thubursicum Numidarum (modern Khamissa) (Image No. 07), depicts a young fisherman, nude, standing on a rock in the sea as he casts a net. Around him are numerous marine animals, including a moray eel, a sea bream or mullet, a flatfish or ray, and squid or cuttlefish.



Image No. 06 and 07. Mosaics representing net fishing (Ferdi, 2005, pp. 138-140).

The third mosaic, discovered at the ancient site of Cuicul (modern Djemila), is part of a composition representing the Toilet of Venus. Along its borders appear maritime scenes, including one of net fishing (Image No. 08 and 09). The scene shows two boats, each with three nude fishermen: One steers with oars, while the other two pull in the large net. Inside the net are numerous captured sea

creatures, while others remain outside it, such as a mullet or sea bass, a sea bream or parrotfish, moray eels, and squid or octopuses.



Image No. 08 and 09. Mosaics representing net fishing from Cuicul (Blanchard-Lemée, Mosaic Houses of the Central District of Djemila Cuicul, 1975, pp. 245-255).

3.2. Fishing with a Rod:

Rod fishing was another method practiced since antiquity. It involved catching fish using a rod, a fine line, a hook, and bait to attract different species.

The first and second mosaics were discovered in Khenchela (Image No. 10 and 11). In the first mosaic (Image No. 10), a fisherman in a white loincloth stands on a platform. He holds a fishing rod in his right hand and a basket of fish in his left. Around him appear various marine animals, such as an octopus, a gilthead sea bream or mullet, a ray, a stylized jellyfish, and others.

In the second mosaic (Image No. 11), a fisherman in a white loincloth and a wide-brimmed hat reclines on the ground in a relaxed pose. He holds a fishing rod in his right hand, while different marine animals surround him, including mullet or sea bream, parrotfish or serrans, and others.



Image No. 10 and 11. Scenes of rod fishing from Khenchela (The Author).

The third mosaic was discovered at the archaeological site of Thubursicum Numidarum, present-day Khamissa (Image No. 12). At the center stands a nude fisherman holding a fishing rod in his right hand. At the end of the line, a fish-possibly a grouper-is hooked. Other marine animals also appear in the mosaic, including an octopus, a sea bream or mullet, among others.

The fourth mosaic, discovered at the ancient site of Cuicul (present-day Djemila) (Image No. 13), shows at its center a nude fisherman in a small boat. He holds a fishing rod in his right hand and a fish in his other hand. Around him are various marine creatures, such as a moray eel or conger, a scorpionfish or sea bream, a ray or stingray, and a stylized octopus or jellyfish, among others.



Image No. 12 and 13. Fishing scenes with a rod of Thubursicum Numidarum and Cuicul (Ferdi, 2005, pp. 140, 144-146).

3.3. Trap Fishing:

Trap fishing used a woven, cage-shaped device designed to capture marine animals. Lured by bait, the creature entered the funnel-shaped opening but could not escape. This technique appears in several mosaics of maritime life. It is shown in the borders of the Mosaic of the Toilet of Venus, discovered at Cuicul (present-day Djemila). Another example comes from a mosaic found at Thubursicum Numidarum (present-day Khamissa).

The first fragment (Image No. 14) shows two fishermen where one stands-likely on a rock-holding a trident, while the other is in a small boat handling a trap. Around them appear various marine animals, including a sea serpent or moray eel, a sole or plaice, sardines, mackerel, mullet or sea bream, as well as an octopus and squid or cuttlefish.

In the second fragment (Image No. 15), a boat carrying several figures, presumably fishermen, is shown. One seems to guide the vessel or scan the surroundings, while two others manage the trap. Another figure plays a musical instrument, all wear tunics and around the boat are marine species including mackerel or mullet-common in the Mediterranean and often caught with traps-as well as sea bream (dorade), sar-type sea bream, and other fish.

In the third mosaic (image No. 16), a nude fisherman stands holding a trap in his right hand. Inside the trap are marine animals, other marine creatures can also be seen in the picture, including an octopus, a moray eel, lobsters and spiny lobsters.



Image No. 14, 15, and 16. Trap Fishing (Ferdi, 2005, p. 140; Blanchard-Lemée, 1975, pp. 249-251).

3.4. Fishing with the Trident:

The trident (The trident, a symbol associated with Neptune, the god of the sea and oceans, is often depicted alongside him in ancient art, particularly on mosaics and statues), is a traditional fishing tool, consisting of a long handle ending in three sharp prongs. This method is usually practiced in shallow or easily accessible waters. It allows fishermen to spear fish directly, choosing larger specimens or those difficult to catch with other techniques.

This mosaic, discovered at the archaeological site of Thubursicum Numidarum (modern-day Khamissa) (Image No. 17), depicts a naked man, most likely a fisherman. He holds a trident in his right hand, aimed at an octopus, and a small hand net in his left. Around him are various marine creatures: an octopus or squid, several fish, two round jellyfish, a dolphin-or possibly a sea monster-seashells, and other sea life.



Image No. 17. Mosaic Depicting Fishing with the Trident (Ferdi, 2005, p. 138).

4- Transformation, Preservation, and Distribution:

Archaeological evidence shows that the marine environment of the ancient city of Caesarea provided abundant resources. This wealth played an essential role in the region's development. Fishing was a crucial activity for the population, who mastered various techniques suited to the local geography.

After fishing operations, the catch was distributed according to its use. Part was destined for local consumption, meeting the daily nutritional needs of Caesarea's population. These products went directly to the markets, ensuring a steady supply of fresh food. Another portion was sent to processing facilities, especially salting workshops, where it underwent specialized treatment. The fish were preserved in different ways-salted, dried, or canned-to serve broader demand both within the region and in wider markets.

Archaeological excavations have revealed the existence of numerous salting workshops located around the town; we can cite:

4.1. The Salting Workshop at Cape Tizerine:

Archaeological remains of this activity were identified along the seashore in 1967, when two English divers, R. A. York and D. P. Davidson, discovered fish tanks (viviers) and

nearby basins that may have been used for fish-salting (Leveau, 1984, pp. 49-50).

Beneath the eastern cliff of Cape Tizerine, several submerged rectangular foundations were uncovered, likely corresponding to additional tanks. Three main rectangular structures, enclosed by masonry walls just below sea level, were identified. Their interiors are filled with rubble and stone blocks, and two appear to be fitted with sluices. Above these submerged tanks, aligned within the cliff face, are four cisterns (Leveau, 1984, p. 50).

4.2. The Salting Workshop at the Trois Îlots site:

At the site of the Three Islets, there was once a small community of fishermen and farmers, which initially grew around a large estate centered on a villa with a cruciform fountain (Leveau, 1984, p. 253). The salting basins were located in the villa's northwestern sector. They were uncovered in 1957 during colonial-era excavations, reported in 1958, and remain visible today, attesting to a fishing population at this promontory (Leveau, 1984, p. 252).

The workshop covers about 11.5 meters in length and 8 meters in width. It originally had two small basins to the south and three large ones to the north. Excavations archeological in 2018, however, revealed four additional basins: one large and three small. The large basins measure about 2.70 by 2.15 meters, while the smaller ones measure about 2 by 1.15 meters. They are built of rubble masonry and lined with opus signinum (tile mortar), which is still visible today. A water reservoir lies at the center of the space, with another to the northeast; both were almost certainly part of the workshop.



Image No. 18. The salting workshop at the Trois Îlots site (The Author).

The salting workshops of the Trois Îlots site were mainly dedicated to producing garum, a fermented sauce that was immensely popular throughout antiquity and well known in Caesarea and the surrounding region. It was made from fish such as sardines, mackerel, or other species, mixed with large amounts of salt. The mixture was left to ferment for several weeks in basins exposed to the sun. At the end of the process, a clear, flavorful liquid was obtained, filtered, and used as a condiment in daily cuisine. Production required careful organization, with basins adapted to the different stages of manufacture.

Garum was not consumed only in Caesarea. Although it was important in local diets, it was also central to the city's trade. Along with wine and oil, it was among the main products exported across the Mediterranean. This made it crucial to the local economy and a strong testament to the region's artisanal expertise. The presence of a port in Caesarea greatly facilitated its trade, enabling the city not only to meet local demand but also to export it to other regions.

Strabo mentions Caesarea's port: "this city has a port, and there is a small island just opposite it" (XVII, 12, 108). Knowledge of the port was later expanded through surveys by

Ravoisié and military engineers, which enabled R. Cagnat to propose a detailed plan (Leveau, 1984, p. 47).

The commercial port was to the east, between the military port and a dike leaning on the islet of the great Hammam. The protected area was approximately nine hectares. A small wadi flows into it and, to the south, the entire end of the port was probably occupied by a beach where boats could be pulled. (Leveau, 1984, p. 48).

According to J. Rougé, Caesarea was the last major port on the North African coast before the Strait of Gibraltar (Leveau, 1984, p. 49; Rougé, 1966, p. 144).

Garum is also attested in several Latin inscriptions, the most important being that of Zarai (Inscription references). (It provides a precise view of the fiscal system applied to merchandise, and bears witness to the rigorous organization of trade at the time). This inscription lists the customs duties payable on various goods, including garum. It states that one amphora of wine (25.18 liters) and one amphora of garum were subject to the same tax, suggesting they had roughly equivalent value. A double duty was levied on 100 pounds of figs or dates (about 37.7 kg), compared with a single amphora of wine or garum. Thus, 50 pounds of figs or dates equaled the value of one amphora of wine or garum. Assuming the portorium (customs duty) rate remained at 1/40-a plausible though unproven hypothesis-the price of one amphora of wine or garum would have been 40 sesterces, while 100 pounds of figs or dates would have cost 80 sesterces (Krim & Filah, 2021, p. 292).



Fig. 4 : Le tarif de Zarai, photographie du moulage présenté à l'exposition de Bruxelles en 1958 (cliché P. Salama).

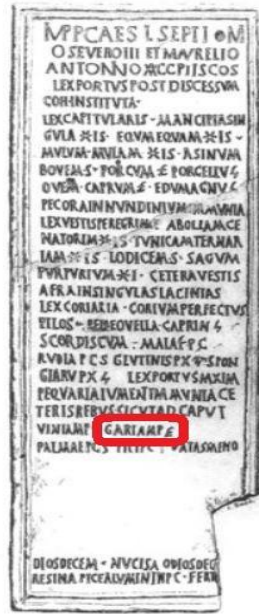


Image No. 19 and 20. Inscription from Zarai mentioning “Garum” (Claus, Kolb, Slaby, & Woitas).

Conclusion:

Through the study of mosaics depicting how the ancient inhabitants of Caesarea interacted with the sea, it becomes clear that the Mediterranean basin, especially along the Caesarean coast, was abundantly endowed with exceptional marine wealth. This was one of the most significant and abundant renewable resources of the period.

The mosaics uncovered at Caesarea offer invaluable insight into the central role of the sea in the lives of its inhabitants. Through the diversity of species and detailed marine scenes, these works attest to a large-scale and well-organized use of marine resources. They show not only the abundance of resources along the city’s shoreline but also the technical expertise of the population in their use-whether for consumption, trade, or transformation (such as the production

of garum). The recurring appearance of these motifs further indicates that the sea was not merely a material resource; it also held an essential place in collective imagination and social values. These artistic depictions reflect both deep knowledge of the marine environment and a deliberate, skilled adaptation to its use.

The people of Caesarea skillfully harnessed their marine environment, particularly through fishing. They developed techniques suited to the available resources and their way of life. Remarkably, some of these ancient methods remain in use today, a testament to their effectiveness and durability. This continuity underscores the enduring connection between ancient and contemporary societies in their relationship with the sea.

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