

# Salted fish and fish sauces from Masada. A preliminary report

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**ABSTRACT:** Salted fish and fish sauces were produced and traded in large quantities in Roman times. This report deals with excavated evidence of fish products (salted fish, *garum* and *allec*) from Masada, a large Herodian fortress in the Judean Desert. The finds include remains of fish and inscribed amphorae, which were imported from Southern Spain. The sauce, *allec*, was of high quality as well as kosher. It fits well with other evidence of luxurious stores stocked by King Herod in Masada.

**KEY WORDS:** ARCHAEOZOOLOGY, MASADA, ROMAN PERIOD, ALLEC, GARUM

**RESUMEN:** Las mojamas y salsamentas fueron producidas y comercializadas intensamente en época romana. Nuestro informe comenta los restos arqueológicos evidenciadores de productos de esta índole (mojama, *garum* y *allec*) recuperados en la gran fortaleza de Herodes en el desierto de Judea llamada Masada. Los hallazgos incluyen restos de pescado y ánforas inscritas que fueron importadas de la España meridional. La salsa *allec*, al igual que el *kosher*, parece haber sido de óptima calidad lo que concuerda con evidencias de otro tipo que demuestran el almacenamiento de productos de lujo, por parte del rey Herodes, en Masada.

**PALABRAS CLAVE:** ARQUEOZOOLOGIA, MASADA, PERIODO ROMANO, ALLEC, GARUM

The purpose of this paper is to describe evidence for the presence of imported fish products at Masada, mainly fish sauces, a special Roman delicacy, in the context of the fortress' unique history in the Jewish and Roman world. This evidence falls into three categories: 1) fish remains; 2) jars which contained fish sauces and 3) inscriptions on jars (*tituli picti*) describing their contents.

## MASADA

Masada is a fortress in the Judean Desert situated on an imposing rock facing the Dead Sea. It was built by King Herod (37-4 BCE) to serve as a winter palace and refuge in times of danger. For this purpose the fortress included large store-rooms stocked with many kinds of food. A Roman garrison held Masada from 6 CE, when Judea became a Roman province, until 66 CE when Jewish sicarii took it over. Three or four years after the fall of Jerusalem the Romans besieged and captured

Masada under the command of L. Flavius Silva but not before its 960 defenders had committed suicide. Josephus Flavius, a contemporary Jewish historian, described the nature and history of Masada in detail. He is the only written source for the story of Masada.

## THE FISH REMAINS

Excavations in Masada by Yadin (1963-1965) yielded fish remains of two distinct categories: 1) scattered fish bones, and 2) contents of a jar.

1. 649 fish bones were found in different loci in the fortress, 327 of which could be identified (Table 1). 97% of these belonged to the family Scombridae (Mackerels and Tunnies), mostly well preserved vertebrae of small regular sizes (Table 2). This high percentage of scombrids is unique in Israel. Scombrid bones were found only in 6 additional sites (out of about 50) and then only in low

proportions of 0.05-6.9% (Table 3). We suggest that the scattered Scombrid bones belonged to salted fish imported to Masada, presumably in Amphorae (see below).

FAMILY	NISP
Carangidae	1
Mugilidae	1
Serranidae	8
Scombridae	317
TOTAL	327

TABLE 1

Scattered fish bones in Masada organized by family.  
NISP = Number of identified specimens.

2. A flat base of a jar contained about 125 g of fine grains of soil mixed with fish remains. A sample weighing 2 g was examined and separated under a binocular microscope (x 8). It contained a large number of fish scales, broken fin spines, vertebral processes, ribs, neurocranial fragments and 1494 recognizable skeletal elements of fish (Table

4). The state of preservation of most bones was good, but many were extremely fragile and tended to disintegrate when handled. About 60% could be identified.

The minimum number of individual fish (MNI) in this sample was 28 (deduced from 28 first vertebrae). By extrapolation 125 g would contain the remains of at least 1750 fish. The largest bones were cleithra and dentaries, measuring about 7 mm. The size of vertebrae was 1.5 mm or less. Most vertebrae had a hollowed centrum and many consisted of transparent «shells» only, typical of young fish. The estimated sizes of the fish were 4-5 cm only.

Most of the bones belonged to the family Clupeidae (Herrings). Some skeletal elements were represented by two types of bones which seemed to belong to two closely related species. Thus, for instance, there were two similar types of maxillary bones, a «rough» one which belonged to *Sardinella aurita* (Round sardinella) and a «delicate» one which belonged to a species not represented in our reference collection. There were also a few bones which belonged to a similar fish, *Engraulis encrasicolus* (European anchovy) of the family Engraulidae.

SKELETAL ELEMENT	Scombridae	Thunnus sp.	K. pelamis	A. rochei	S. sarda	TOTAL
Articular	1					1
Quadratum		1				1
Hyomandibular					6	6
Opcerulum	2					2
Preoperculum	2					2
Scapula	6					6
First vertebra					2	2
Abdominal Vertebra	27				31	58
Caudal vertebra	14	168	1	1	36	220
Dorsal spine	3					3
Basioccipital	16					16
TOTAL	71	169	1	1	75	317

TABLE 2

Scombrid fish bones in Masada. Identifications and skeletal elements.

SITE	NISP	Scombrid bones	%
Kasarvit (1)	1725	1	0.05
Askelon (85) (2)	2109	7	0.3
Hatoula (3)	621	5	0.8
Acre (1)	250	3	1.2
Tell Abu Hawam (1)	173	4	2.3
Tamara (4)	360	25	6.9
Masada	327	317	96.9

TABLE 3

Remains of scombrids. Israel and Northern Sinai. (1) Unpublished data, (2) Lernau & Lernau, in press, (3) Lernau & Lernau (1994), (4) Lernau (1986).

ELEMENT	NUMBER
Neurocranium	
Part	99
Basioccipital	21
Posttemporal	6
Branchiocranium	
<i>Oromandibular region</i>	
Maxilla	37
Dentary	2
Articular	9
Quadrate	8
<i>Hyoid region</i>	
Hyomandibular	38
Opercular	20
Preopercular	9
Epihyal	4
Hypohyal	9
Urohyal	6
Appendicular skeleton	
Cleithrum	34
Vertebral column	
General	279
First vertebra	28
Abdominal vertebrae	354
Caudal vertebrae	522
Fins	
Spines	9
TOTAL	1494

TABLE 4

Skeletal elements in sample of *Garum*.

## THE JARS

1) *Masada, Inv. 1039-1047*. Fragment of a round-bottomed jar in hard-fired red clay. This fragment held the remains of fish discussed above and was found in a room of the defensive wall of Masada not in the storerooms. The shape and fabric indicate that this is a locally made Syro-Palestinian baggy jar. This shape has a long history, from the Hellenistic to the Early Islamic periods. Petrographic analysis is consistent with a local origin. Micromorphological study of the non-faunal residues in the fish remains sediment show: 1) remains of vegetal material with residues of plant organs and amorphous organic fine material; 2) Selenite (gypsum crystals) cleavage fractures; and 3) sand with grains of quartz, feldspar, limestone and a grain of weathered mica-schist. The composition of the sand, especially the schist grain, indicate an origin foreign to the Eastern Mediterranean. Different origins for the jar and for its contents suggest that the fish sauce was originally imported to Masada in another container which has not been recovered. The fact that the sauce seems to have been mixed with sand, presumably in its place of origin, has not been satisfactorily worked at yet.

2) *Masada, Inv. 1047-650*. 15 joining fragments preserved part of a shoulder, wide neck and lower handle attachment of an imported amphora. The exterior surface was covered with a yellow slip. A bilingual inscription (Latin and Greek) in black ink was located on the exterior neck. The shape and fabric indicate that it belongs to Peacock and Williams' «Class 18», produced on the southern Spanish coast and used to carry fish-based products (Peacock & Williams, 1986). It is dated to the late first or early second century CE. In this section the clay matrix is reddish-tan in colour, fairly silty and rich in mica flakes. Detailed analysis of the composition of the clay matches an amphora classified by Peacock and Williams as «Class 14», originating from the southern Spanish coast and dating from the mid-first century BCE to the later second century CE. This type was also used for trade in fish-based products.

The discrepancy between the typological and the petrographic identifications of this amphora may well be the result of the absence of specific petrological descriptions in Peacock and Williams. In any case we assume with a great deal of certainty that this amphora was imported from Spain.

The inscription on the amphora reads the following:

## Diplomatic transcript Reconstruction

1. GARUM [	1. Garum [
2. [symbol]	2. [symbol]
3. Δ[	3. Δ[
4. BACIAEΩ.[	4. Βασιλεωε[
5. ...P.O...[	5. ...p.o..[
6. A	6. A(mphorae) vel A(nnorum)[

According to this inscription the amphora contained *garum* (a fish sauce) «of the king»: Βασιλεωε. Since the jar has been broken after the now erased sigma, the name «Herod» could have followed the title, as it did in Latin in a series of inscriptions on fragments of wine jars also found in Masada. There, the genitive case, «of the King», stood for the «customer», the person who purchased the amphora, its present owner - namely Herod (Cotton & Geiger, 1989b).

3) *Masada, Inv. 92-559/3*. A small fragment of an amphora, on which we find the letters Mu[, which could be expanded to yield Mur[ia, a fish sauce.

4) *Masada, Inv. 310-1129*. A small fragment of an amphora with the first line of a short inscription saying E]xcel(lens). This could refer either to wine, or to a fish sauce.

## ROMAN FISH SAUCES

*Garum*, *muria* and *allec* were fish sauces popularized by the Romans, and widely consumed for about a millennium. Their nutritional importance was threefold: 1) they served as condiments in periods which were poor in tasty additives to food; 2) they preserved the nourishing elements contained in fish meat for prolonged periods of time; 3) they were used to conserve fish, meat, vegetables etc. Similar fish sauces are still prepared today in South Asia, e.g. Nuoc-Mam in Thailand (Curtis, 1991). Fish sauces were manufactured as a by-product in special fish-salting plants (salteries) located along the southern and northern shores of the Western Mediterranean and along the Atlantic shores of Spain, Portugal and Northern Africa (Ponsich & Tarradell, 1965). These installations combined proximity to rich fishing grounds with the production

of crude sea-salt in evaporation pools. The importance of fish sauce in an extravagant Roman cuisine may be gauged from Apicius' cooking book which took its present form c. 400 CE: at least ten different varieties of fish sauces were used in preparing the gourmet recipes (André, 1974).

We shall not discuss in detail the production of Roman fish sauces yet the differences between the types are important: *garum* was the main product, a salty, spicy, sometimes foul smelling clear fluid strained from small fish which had undergone a process of autodigestion in the sun. *Muria* was a salty liquid similar to *garum* but of lower quality. It was used for conserving vegetables, fruits, olives or fish rather than as a spice for its own sake. *Allec* was the residue of *garum*, a thick semi-liquid mash containing macerated meat, scales, bones etc. This was at first regarded as a cheap spice (Cato recommended it for slaves - *De Agricultura* 58), but later it gained a reputation of its own and became an expensive additive to different dishes (Curtis, 1991). It follows that excavated bony remnants of a fish sauce, as in Masada, are likely to be the remains of *allec*, not of *garum* or *muria*.

There are only a few ichthyo-osteological studies of remains of *allec*. They show two distinct patterns -one kind is made of many different species of fish of different sizes, while the second contains a limited number of similar fish, with regular small sizes. Driesch (1980) described the contents of a large number of broken amphorae found in Cerro del Mar in Spain, consisting of bones of 16 different kinds of fish. Lepiksaar (1986) studied *allec* found in an amphora in Salzburg, composed of bones of 24 kinds of fish but also invertebrates and a, probably intrusive, frog. The large variety of small fish and other organisms, some of them of low commercial and nutritional value, and the rough accompanying gravel, suggested to Lepiksaar a cheap sauce made of the contents of a fine net dragged in low waters without much sorting or cleaning.

Other studies show a different pattern. Thus Wheeler & Locker (1985) describe fish bones from submerged amphorae off the Sicilian coast. They all belonged to Clupeidae, some identified as *Sardina pilchardus*. These were relatively large fish, 10-17 cm long. Studer (1994) has recently described the contents of a «pilgrim's flask» from Late Roman-Nabatean Petra with thousands of very small bones, 99% of which seemed to belong to one Clupeid species (sardine or anchovy). A si-

milar type of *allec* from York, made exclusively of very small local Clupeids, was described by Jones (Jones, 1988).

It seems to us that high quality *allec* had to be made of very small fish with a high fat content. Schools of young fish could be caught for this purpose at the appropriate season and the soft, minuscule bones would go unnoticed by the consumer. In contrast, low quality *allec* (and presumably other fish sauce as well) was a by-product of the salted fish industry, made from left-over small fish without sorting, including contaminants like invertebrates and other organisms.

We suggest that the *allec* from Masada, which was made of very small and regular fish of a limited variety, was a high-quality product, itself a by-product of high-quality *garum*, both worth the expense of shipment from the shores of Western Europe to the luxurious winter resort of King Herod. In addition, the salted scombrids described above might well have been imported to Masada together with the sauces from the same production plants.

#### DATING THE REMAINS OF FISH SAUCES IN MASADA

The inscribed ceramic sherds and the remains of *allec* described above were each found in a different locus, in the same general area of the fortress. The sherds did not carry their own dates, and the archaeological contexts did not allow exact dating. Nevertheless it seems highly likely -but not entirely beyond doubt- that the fish sauces at Masada date to the Herodian phase of occupation. This assumption is based, in short, on the following considerations (detailed discussion will be found elsewhere [Cotton, Lerna & Goren, in press]): 1) The Sicarii could not be responsible for this kind of import. 2) The mention of the word βασιλευς «of the king» would fit no other occupants of Masada but Herod. 3) Herod's name, along with precise dates, appears on a series of jar inscriptions from Masada, which are similar, sometimes identical in style to the inscribed «*garum*» jar. 4) All the inscribed amphorae found in Masada carrying their own dates, were dated to between 27 and 14 BCE, attesting to large shipments of imported wine to Herod. 5) Many inscribed dated and undated imported amphorae carried luxury products from the western part of the Roman Empire. 6) The possibility that some of these amphorae were part of the army's supplies,

perhaps meant specifically for Silva and his staff, cannot be entirely ruled out. To some extent this depends on the length of the siege, which seems to have been much exaggerated (Roth, 1995).

#### KOSHER *allec* AND *garum*: FISH SAUCES PREPARED ESPECIALLY FOR JEWS?

The *allec* from Masada had another property - it was also kosher. The only kind of kosher fish sauce acceptable to Jews would be one made of fish possessing both fins and scales. Scaleless fish and all invertebrates are forbidden according to Jewish law (Lev. 11:9-11; Deut. 14:9-10). Jews, therefore, could safely use labeled fish sauces specifying the species from which they were made, e.g. GARUM SCOMBRI, or HA(LLEX) S(COMBRI) (Curtis, 1991). It seems to us significant that the *allec* described here contained only two kinds of fish, namely clupeids and anchovy, both of which were considered kosher. The original vessel in which the *allec* reached Masada might well have carried a label advertising its high quality and specifying the types of fish it was composed of - in other words its *kashrut* certificate. It is not at all inconceivable that Herod who ordered, or received as a gift, a special consignment of *Philonianum* from Italy, had ordered a kosher kind of *allec* to be sent to him to Masada. The presence of the word Βασιλευς on the amphora which contained *garum* suggests that it was ordered by Herod himself, or sent to him as a present, and if we are right to assume that the «*kashrut*» of the *allec* was of importance, then it is plausible that this *garum* was kosher as well.

#### CONCLUSIONS

The storeroom complex of Masada is dated to the main building phase, c. 30 to 20 BCE. The presence of imported wine jars dated to 27 and 26 BCE, and the remains of a large shipment of wine from 19 BCE (Netzer, 1991) support this dating: it suggests that by 19 BCE at the latest Herod was stocking the storerooms. These stores rightly inspired Josephus to praise: «But the stores laid up within would have excited still more amazement, alike for their lavish splendour and their durability. For here had been stored a mass of corn, amply sufficient to last for years, abundance of wine and

oil, besides every variety of pulse and piles of dates» (BJ 7.295f., LCL translation). The importation of Italian wine (Cotton & Geiger, 1989a), apples from Cumae (Cotton & Geiger, 1989b), *garum*, *allec* and salted scombrid from Spain - in other words all the ingredients necessary for a proper Roman *cena* - demonstrates in concrete and palpable terms Herod's desire to emulate the tastes of the Roman aristocracy to the very last detail. This was part of the process of Romanization of local aristocracies in the Roman Empire (Edmondson, 1990). It fits well with other aspects of Herod's rule which equally show the influence of Roman things.

As we have seen, kosher fish sauces had to be of high quality, yet high-quality fish sauces were not necessarily kosher. The analysis of the remains of *allec* found on Masada shows that it was both kosher (only fish with scales and fins) and of high quality (small fish, no contaminants). This could be a coincidence, but it seems to fit into a general pattern according to which Herod tried to reconcile his Roman tastes with the demands imposed on him by the rules of the Jewish religion.

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