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Net fishing in the central Mediterranean – An ethnoarchaeological research on the immaterial culture of the societies of the past

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Abstract

This paper explores how ethnoarchaeology can help to rescue the intangible cultural heritage of Mediterranean net-fishing from the threats of technological modernisation. Using the Salento peninsula (southern Italy) as a case study, we integrate ethnographic fieldwork with archaeological, historical and comparative data from Spain and the Greek Ionian Islands to reconstruct the operational chain of traditional net-fishing. Ancient tools such as netting needles and sinkers, although rarely preserved in the archaeological record, can be interpreted through living practices still observable in Salento. Roman and Bronze Age finds from Apulia were re-contextualised by present-day usage, showing remarkable technological continuity since at least the 2nd millennium BC. Cross-Mediterranean comparison reveals broad congruence in net types, tools, dyeing recipes, and social rules for resource management, suggesting either shared Greco-Roman and post-medieval heritage or convergent responses to comparable coastal ecologies.

1. Preface

Ethnoarchaeology allows us not only to better understand the technological characteristics of the societies of the past, but it also provides us with a useful tool for understanding their immaterial culture. In fact, the intangible cultural heritage – today recognized by UNESCO too – is an integral part of the cultural heritage that has been transmitted to us by our ancestors (ich.unesco.org/en/home; DEACON & SMEETS, 2013).

The intangible cultural heritage is made up of living traditions; their importance does not lie in their cultural manifestation, but in the wealth of knowledge and skills that are transmitted from one generation to another (LIPP, 2013; LANE, 2016). Unfortunately, due to their immaterial nature, they cannot be preserved in physical form: therefore, they are destined not to leave direct traces in the archaeological record. We can, however, recover their traces, thanks to ethnoarchaeology. That intangible cultural heritage is connected to cultural diversity and human creativity and, ultimately, to man's response to the environment's potential in which communities reside now and in the past. Intangible cultural heritage is closely correlated with the surrounding environment and with its history.

Current societies – not only those located in the West – are in fact afflicted by a progressive loss of memory about their past. Gestures

and operational chains, that were a living part of the cultural tradition for many communities until the middle of the last century, have now largely disappeared and been forgotten. Objects that were of everyday usage until recently, are now silent museum exhibits. This makes increasingly difficult to properly understand the artifacts that are found during archaeological excavations: the preliminary, essential stage if we want to reconstruct the social and cultural context of ancient societies.

This is a significant challenge for the ethnoarchaeology of the new millennium: in order to survive, ethnoarchaeology will have to combine the few data that can still be collected in the field, with the scarce written sources, ethnological collections and antiquities altogether.

Relevant future challenges for ethnoarchaeology will be to document and study traditions and knowledge still surviving in a quickly transforming world. Furthermore, in most countries, archaeological research suffers a widespread decrease in funding. This situation suggests the necessity to reshape ethnoarchaeology, producing a new research strategy that appraises the remains of ancient local traditions, thus preventing their complete disappearance.

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2. The territory

To analyse fishing as an example of immaterial heritage and its potentiality in ethnoarchaeological studies, we chose the Salento peninsula, a traditional and conservative area from a cultural point of view, located in the south of Italy. The Salentine peninsula, or Salento, is a region of southern Puglia, located between the Ionian Sea to the west and the Adriatic Sea to the east; it constitutes the “heel” of the Italian “boot”. Salento includes the entire administrative province of Lecce, almost all of the Brindisi province and the eastern part of the Taranto province. Linguistic, historical and cultural characteristics are what distinguish Salento from the rest of Puglia. In classical antiquity it was called Messapia, from the Messapians, a Iapygian tribe that inhabited this region.

The territory, with an elongated and narrow shape, has a flat configuration with rare hilly reliefs; it faces two seas: the west coast, on the Ionian Sea, is characterized above all by long sandy beaches; the east coast, on the Adriatic Sea, is usually rocky and cliff-like. The two seas traditionally meet in Santa Maria di Leuca (at Punta Meliso). This geographical position has always favoured the development of fishing activities; still today, the seafarers of Gallipoli and Castro practice both fishing near the coast, as much as in deep water.

Salento offers a particularly fertile ground for investigating the life of fishing communities as a strategy of adaptation to the local environment (GIARDINO & ZAPPATORE, 2022). Fishing communities were once much more widespread in the central Mediterranean, but today they have either disappeared in most places or reduced to economically marginal entities. Salento has allowed the preservation, almost to the present day, of traditions and gestures related to fishing, largely disappeared elsewhere. This has happened thanks to the partial isolation

of this area, linked both to its geographical position and to historical events (Figs. 1-2).



Fig. 1. Italy and Apulia. Google Earth Pro, modified.



Fig. 2. The Salento peninsula. Google Earth Pro, modified.

3. The fieldwork in Salento

An ethnographic survey was carried out in the Salento peninsula between 2015 and 2017. Because of its morphological nature, the area has an ancient fishing tradition, although what is practiced in the modern days is mainly subsistence, with navigation almost always in view of land (ANSELMINI, 1990: 11-50).

We asked a series of standardised questions to fishermen who still used traditional fishing techniques. We inquired about the tools they employed, how they used them, their fishing activities and associated tasks (e.g., equipment preparation, net repair, and dyeing), as well as

the labor division, the religious beliefs, and the superstitious rituals associated with their work. The interviews were accompanied by photographic documentation, audio recordings, and, whenever possible, video recordings. The next stage of our study was to organize the ethnographic material, comparing it with archival, historical material, and documents collected in other geographical areas. Therefore, the research transitioned to an ethnological level, thanks to the systematic, comparative analyses (LÉVI-STRAUSS, 1975: 203).

4. The archaeological evidence connected to fishing nets

For thousands of years, fishing has been the main economic activity for many communities living near stretches of water, rivers, lakes or seas. Nevertheless, the archaeological record does not provide sufficient real evidence for this social-geographical situation. Indeed, the paleozoological remains, left by sea creatures, cannot be easily identified, with the exception of mollusc shells. Well known is the phenomenon of the shell middens, that characterise the subsistence economy of Northern Europe coastal communities during the late 4th and 3rd millennium BC (ANDERSEN, 2007).

Unlike shells, the archaeological evidence left by fish is much more elusive, since their bony remains are much smaller and more fragile than those of terrestrial animals. Therefore, their recovery

generally takes place during an excavation thanks to the soil flotation technique. The practice of soil flotation is a methodology that came into use only relatively recently; this helps explain the general absence of fish remains in most of the records concerning old excavations.

Occasionally, the examination of human remains can provide us with information on fishing activities. Sometimes an unusual dental attrition of humans can be produced by the continuous pulling of strings between the teeth in the making of fishing nets. This was found in some of the skeletons from Atlit-Yam, a prehistoric site radiocarbon dated between the 9th and the 7th millennium BC on the coast of Israel (HERSHKOVITZ & GALILI, 1990). Further information on the incidence of fishing in past communities comes from archaeometric analyses

carried out on human remains, thanks to the isotopic reconstruction of their paleodiet. The isotopic composition of the bone collagen, the main component of the bone organic matrix, mostly reflects the isotopic composition of the foods eaten in the lifetime. Moreover, various foods have distinct isotopic signatures, allowing us to trace the type of food that produced them (DENIRO, 1985; HEDGES, 2006). Stable carbon and nitrogen isotopes ($\delta^{13}C$, $\delta^{15}N$) are very useful in distinguishing

between a land diet from a marine one, and to discriminate between the consumption of freshwater and marine fish⁽¹⁾.

As for the Salento peninsula, the area under consideration, most of the information on fishing in antiquity is provided by the presence of artifacts connected to these activities in archaeological contexts.

5. Netting tools

Traditionally, fishing nets manufacturing was carried out using a fork netting tool. Today it is possible to distinguish between double-forked instruments or “filets” (the two fork ends are usually placed at 90° to each other) and netting needle shuttles, long and flat with a point at one end and a fork at the other. Until recently, both types were often made of wood, although there are also tools made entirely of metal. At present, the shuttles are usually produced in plastic; the metal string is also used in the manufacture of fish traps, because of their greater resistance and solidity. The dimensions of the netting tools are variable and closely related to the size of the nets to be produced (Figs. 3-4).



Fig. 3. Netting tools made by reed, wood and iron, 19th-early 20th century. From Tricase (Lecce). Photo by T. Zappatore.



Fig. 4. Netting tools made by olive wood, half 20th century. From Leuca (Lecce). Photo by T. Zappatore.

Bone netting needle shuttles have been known since the Neolithic, such as the item from Atlit-Yam (Israel) (GALILI *et al.*, 2013, figure 3A). The items found in the excavations of the coastal villages in the Sultanate of Oman, in the Near East, are among the oldest forked netting tools. In this area, fishing still plays a decisive role in the economy and nutrition of the local communities. The use of double-forked metal tools is still documented in the manufacturing and repairing of nets, an activity that is generally carried out by men. The copper alloy tools from Ras Al-Hadd, a coastal site overlooking the Arabian Sea, date back to the Early Bronze Age (3200-2800 BC) (GIARDINO, 2019).

Other metal items come from archaeological contexts of the eastern Mediterranean, from Gaza, and they can be dated back to the Bronze Age (PETRIE, 1933, pl. XV). It is also worth mentioning the netting needles from the wreck of Uliburn, of which, however, more precise data is lacking.⁽²⁾

In the central Mediterranean the presence of netting tools is much later, going back to the 6th-5th century BC. The oldest tool in Italy comes from western Sicily; it is in bronze and it is about 20 cm long (GABRICI, 1928, figure 157A; RAVARA MONTEBELLI, 2009: 193). It belongs to the double fork type and it was found in the first half of the 20th century, during the excavation of the sanctuary of Malophoros at Selinunte, an area traditionally linked to fishing activities.

In Spain, the oldest netting needles have been found in Phoenician-Punic contexts (VARGAS GIRÓN, 2020: 140).

In front of Salento, on the Greek Adriatic coast, the first findings are from the Greek period: double fork metal tools were found in Lefkada, in the Ionian Islands. In Salento, netting tools are known only from the Roman Imperial age; they all belong to the double-fork type and are made of copper alloy. They were found at San Foca (Lecce) (D'ANDRIA, 1980, tab. 26) and in the surroundings of Egnazia (Fasano, Brindisi); other items dating back to late antiquity and the Middle Ages come from this area too (Figs. 5-6).

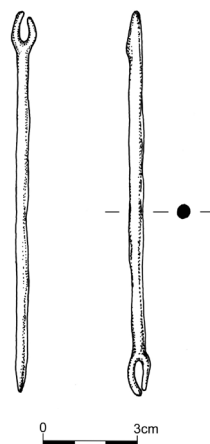


Fig. 5. Bronze double-fork netting tool, Roman imperial age. From Egnazia (Fasano - Brindisi), Tomb Cimino 37. Drawing by T. Zappatore.

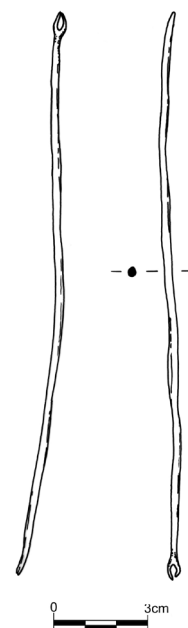


Fig. 6. Bronze double-fork netting tool, 4th-6th century AD. From Egnazia (Fasano - Brindisi). Drawing by T. Zappatore.

(1) bio.uniroma2.it/palaeodiet-reconstruction (retrieved 23/11/2019); ich.unesco.org/en/home (retrieved 23/11/2019).

(2) PULAK, 1988. Judith Powell, however, declares that she saw them in 1991 at the Bodrum Museum of Underwater Archaeology (POWELL, 1996: 114, note 77).

6. Fishing gear sinkers

Fishing sinkers – made of stone, terracotta or metal – were frequently recovered during archaeological exploration in coastal settlements, graves, harbours, and shipwrecks all around the Mediterranean Sea. They often testify the existence of nets that, because of their perishable materials, have left no other traces. Yesterday as today, different nets were used for each type of fishing; they changed for the weight and the width of the links, therefore the sinkers had to be adapted to various needs.

Stones sinkers were drawn in Egyptian fishing scenes since the early dynasties (BREWER & FRIEDMAN, 1989: 38-46). Generally, they have only one perforation –sometimes natural, but more often artificial –, but there are also items with more than one hole; in this case a wooden shaft was inserted into the holes. They were tied to the net armour through suspension holes, or through grooves around the edge of the object (RAVARA MONTEBELLI, 2009: 174). They were generally used for gill netting fishing, and local rocks were used to make them. In some cases, they could also be used for line fishing (DEPALMAS & DI GENNARO, 2015: 23), or even to position traps, as ethnological examples attest (STEWART, 1982: 86). Many Italian archaeological contexts have yielded stone weights, belonging to various periods.

Terracotta sinkers are variable in shape, weight and size, depending on their use; generally, they have cylindrical, spheroidal or discoidal shapes. Cylindrical sinkers have the hole placed longitudinally; depending on the weight and shape, they can be for gill netting or for net casting. Sometimes, as it also happens at present, they may have a very similar shape to that of spindle whorls and, like today, they are used for small trawling, thanks to their capability to roll on the seabed. It is probable that some of the “spindle whorls” that were found in the Salento coastal caves are, in reality, net sinkers. Prehistoric “spindle whorls” were recovered at the Grotta Zinzulusa near Castro (Lecce), at the Grotta dei Cervi at Porto Badisco (Lecce) (TIBERI, 2018, figures 52: 5-7, 56: 8-9, 57: 5, 74: 3-5) and in the Bronze Age site of Le Pазze at Ugento (Lecce) (BIANCO, 1980: 5-44, n. 11) (Fig. 7).

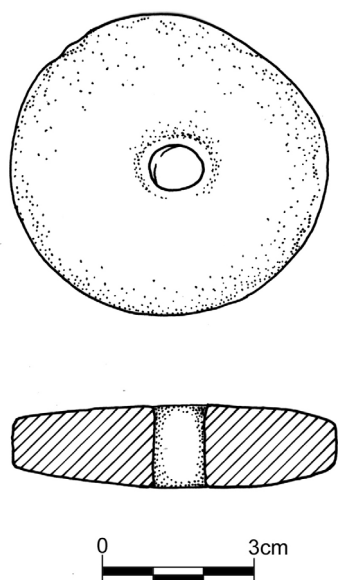


Fig. 7. Terracotta sinker. From Grotta Zinzulusa (Castro, Lecce). Drawing by T. Zappatore.

Large cylindrical terracotta sinkers were found in Apulian protohistoric sites of the Early and Middle Bronze Age, at Roca Vecchia (Melendugno, Lecce) (SCARANO, 2012: 320-326, n. 4.46), Punta Le Terrare (Brindisi) (WILKENS, 1998: 223-247) and at Monopoli - Piazza Palmieri (Bari) (CINQUEPALMI, 1998: 109-124). These items are 18-19 cm long (8-9 cm diameter) and they weigh from 923 to 1,605 g (Figs. 8-9).

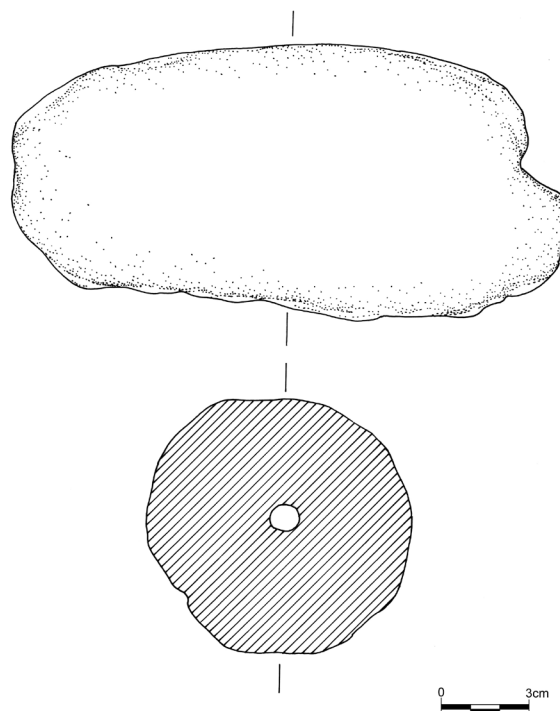


Fig. 8. Terracotta sinker, Early - Middle Bronze Age. From Punta Le Terrare (Brindisi). Drawing by T. Zappatore.

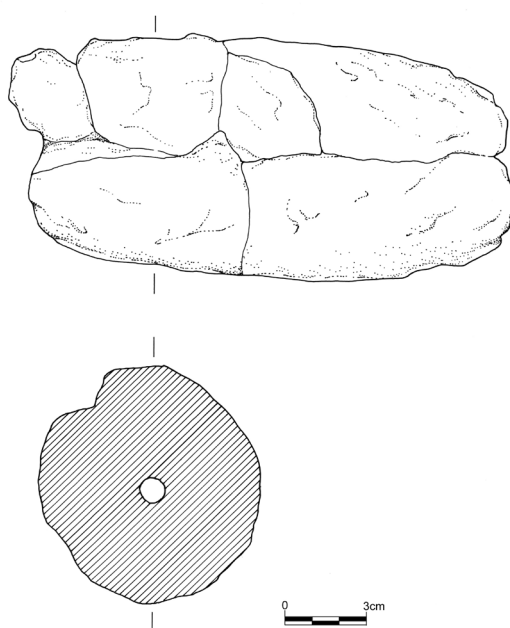


Fig. 9. Terracotta sinker, Early - Middle Bronze Age. From Piazza Palmieri at Monopoli (Bari). Drawing by T. Zappatore.

Terracotta discs with one or more holes were used for gill netting. In Salento, a terracotta sinker disk was found in the Middle Bronze Age coastal settlement of Le Pazze at Ugento (Lecce) (1600-1500 BC). It has a 6 cm diameter, with two opposite holes at the edges (BIANCO, 1980: 29, tab. 11, 10).

Sometimes disks made from fragments of pots were used also as sinkers, cut out and drilled for this purpose: protohistoric examples come from the Grotta dei Cervi at Porto Badisco (Lecce); its centre hole was produced with a drill. Similar sinkers obtained from raw, glazed and painted pottery vessels come from the medieval levels of the archaeological excavation at Castro (Lecce) (Fig. 10).

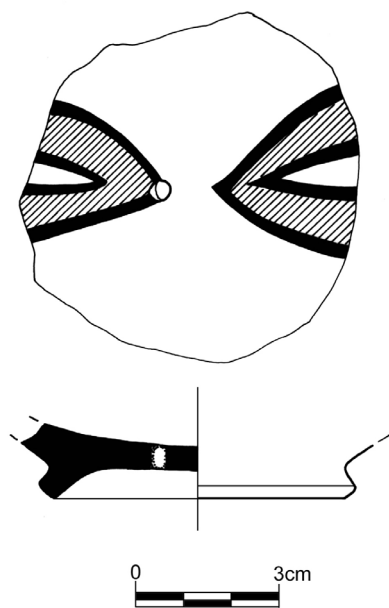


Fig. 10. Medieval nets sinker. From Castro (Lecce). Drawing by T. Zappatore.

Metal sinkers, usually made with lead, are still used in gill netting. They are often simple pieces of rectangular or circular lead pressed and flattened to adhere to the net and to the rope of the mesh reinforcement; sometimes they have the shape of hollow cylinders.

Lead sinkers were sometimes made in the fishers' villages, exploiting the low melting temperature of lead (327° C) that made casting

7. Fishing in Salento peninsula

The fishing net technique is a skill which fishermen and their families have been handed down from one generation to another. It is a tradition which often has different nuances in the various towns of the Salento peninsula (province of Lecce) where fishing nets are made.

The actual construction of the nets, as well as their repair, before nylon and the industrialization of fishing, was a very long process done by different people, depending on the towns and areas. Along the Ionian coast, such as at Gallipoli, the work was done by the fishermen themselves; whereas, on the Adriatic coast, Otranto, Castro, Leuca, it was done by women. The twine used was of natural fiber, generally hemp, grown and processed in nearby towns. More recently, in the 20th century, the material used was, instead, a rather coarse and durable cotton. In Castro, this was commonly called "ravetta" or "travetta" in the local dialect, which is probably a distortion of the name of an undisclosed company that supplied the local fishermen with raw cotton of low quality during the fascist era. Practically speaking, through a series of knots, a diamond-shaped mesh was created. The size of

very simple. Still today, in the Ionian Islands, the fishermen use melted lead sinkers for their activities. Historical age moulds for casting folded rectangular sinkers were found in Tel Shikmona, near Jaffa, in the Carmel coast (GALILI *et al.*, 2013: 151).

A lead sinker of the folded plate type comes from the settlement at Punta D'Alaca in the island of Vivara (Procida, Naples), a site that gave many samples of the use of fish for food. The finding can be dated back to the early Middle Bronze Age (16th-15th century BC) (BERTINO *et al.*, 2020: 54-55, figure 51) (Fig. 11). This is the first evidence of lead sinkers in the Central Mediterranean; it has parallels with similar items from the Late Bronze Age settlement of Pyla - Kokkinokremos in Cyprus (13th-12th century BC) (STOS GALE & GALE, 2010: 399).

Folded lead foil discs come from the central Tyrrhenian Sea, from the site of Punta Chiarito, on the island of Ischia (Naples). They are probably gill net sinkers and are dated to the 8th-7th century BC (ALECU, 2005: 12).

Lead sinkers have been found in Basilicata, in the area of the Greek colony of Eraclea, in a 7th-6th century hoard (HÄNSEN, 1973: 421-422, figure 15). Almost contemporaneous with the pieces from Eraclea is the evidence of lead sinkers in folded foil from the Salento peninsula. An item was found in the area of Grotta Porcinara, in Leuca (Lecce), a place of worship where it was associated with 7th century BC pottery (D'ANDRIA, 1978: 47, 90, n. 297). Further examples come from San Foca (Lecce), as well as a mould to produce them, dating back to Roman imperial times (D'ANDRIA, 1980: 82, tab. 26).

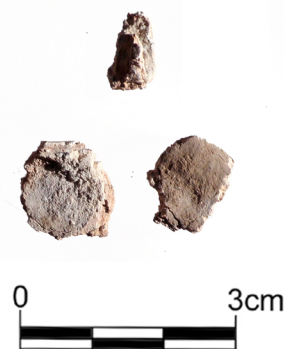


Figure 11. Lead sinker, Middle Bronze Age (16th-15th century BC). From Vivara Punta d'Alaca (Procida, Napoli). Photo by C. Giardino.

the mesh would be measured at the beginning of work using a piece of reed or sanded wood, and then, as work progressed, even using fingers alone. The size would vary according to the type of fishing to be achieved and the size of the fish to be caught. The different types of nets were characterized by the number of meshes that one could count within the palm of the hand; the higher was the number, the smaller were the meshes.

A special needle or shuttle was used for weaving and repairing the nets. In dialect it was called "cuceddha". It was made of wood by the fishermen themselves and has now been replaced by plastic, although its shape has remained the same. The type of wood used varied from town to town depending on the type of plants available locally. For instance, in Tricase, olive wood (*Olea europaea*) was a must, in Castro, oleander (*Nerium oleander*) was preferred. In Otranto however, a naturally growing tree was used, which is locally called "turice", the dialect name for hackberry (*Celtis australis*), a tree with a flexible wood also used to make whips for horses, among other things. It was therefore

important that the wood used, whatever it might have been, should be resistant and flexible. The pieces of wood were trimmed until they became a thin strip of the desired width, according to the size of the net to be created. The shuttle was made with a pointy tip on one end, to facilitate entry in the mesh. It also had a tongue in the centre, which allowed to easily hold the weaving material.

In Leuca, however, the shape of the shuttle used traditionally was somewhat different. It was a rod with two forks at the two ends, which were used to hold the thread. The wood used in this case was from an olive tree. The same double forked shape, but made of different and much more durable materials, such as forged iron, were those "*cuced-dhe*" which were used to weave and bind together the reeds used for making fishing traps (Figs. 3-4).

Regardless of the shape of the shuttles, the manufacturing process of the nets was the same. To begin with, a single mesh was created, and then others were added row by row until the desired length was achieved. It was a very long process which could last up to one year or more. Both during manufacturing and repair, it was very important for the net to always be stretched very tightly. Still today, in Gallipoli, fishermen sit on the ground, or on a low stool, to hold the net tightly with their feet while repairing any tears. In Castro, ancient photographs show women repairing their nets holding them firmly with a boulder. Sometimes the nets were fixed to the wall of caves, which are quite common in the area of the Castro's harbour (Figs. 12-13).

The phase of net dyeing was fundamental. The usual white colour of the cotton would deter the preys. It was therefore necessary to make the nets less visible to fish by colouring them with a classic brownish hue. To achieve this, a natural dye was used, made from the bark of the

Vallonea oak (*Quercus ithaburensis*), a typical oak of the area of Tricase, but also present throughout Salento. Many varieties of pine trees were also used. The bark of these plants contain tannins, which had the additional benefit of preserving the nets from rot or decay (HUWART, 1908; SAVO & CANEVA, 2009). The bark, once dried, was finely crushed in huge rocks carved in the shape of a mortar, called "*stompi*" and beaten with a thick branch which had been made smooth and rounded at the base, called "*pisaturu*".

The resulting powder, called "*pitichia*" in Castro, and "*zappinu*" in Otranto, was boiled in huge containers filled with water and then poured into even bigger stone basins, with the addition of lime and mastic, an aromatic Mediterranean shrub whose scent attracted fish. From time to time, the nets to be dyed were immersed in this mixture. Then, the nets were spread out on piers to dry. The colour of the nets varied depending on the seabed in which they would be used, to make them darker, walnut shells were added accordingly. This process was systematically repeated every month during the full moon, a time when fishing is less productive. In Otranto, however, the process seems to have been repeated only a couple of times a year (Fig. 14).

It is implicit that such nets, which were made with completely natural materials, and therefore, perishable, should be rinsed with fresh water after each use in order to prevent rotting. They were then spread out to dry on supports called "*spannitùri*" (Fig. 15). If accurately treated and when necessary, repaired, however, the nets could have a long life, even in the order of a few decades, and could therefore be passed on to the next generation. Still today, in Castro some fishermen use nets that are forty years old or even more.



Fig. 12. Women repairing the nets, Castro (Lecce). From Corrado Sofia: *Puglia Magica: le rondini del Salento*, Rai (Radio Televisione Italiana), 1963.



Fig. 14. Fisherman dyeing the nets, Castro, (Lecce). From Corrado Sofia: *Puglia Magica: le rondini del Salento*, Rai (Radio Televisione Italiana), 1963.



Fig. 13. Fisherman repairing the nets, May 2015. From Gallipoli (Lecce). Photo by T. Zappatore.



Fig. 15. Nets spread out to dry, early 20th century. From Castro (Lecce). From COLUCCIA, 2015: 22.

At this point, we have come to the phase of arming the nets, that is, preparing them for fishing. The process consisted of fastening a rope lengthwise along each side of the net. Then on one side the floats or corks, called “*cammalora*”, were attached, and on the other side the weights, so that, once in the water, the net would sink from one end, and float from the other a few meters below the surface (Fig. 16). The side with the corks was not to be stretched too tightly, but left a bit supple, so as to deceive the fish and entangle them more easily. Everything is perfectly balanced: two weights are used for each float to sink the net.



Fig. 16. Cork floats, early 20th century. From Tricase (Lecce). Photo by T. Zappatore.

In the past, the sinkers could be made of terracotta or lead, depending on their use; the latter was used for fishing with gill nets and it was made of pieces of metal that were pressed to be adapted and fixed to the rope (interview with Mr. Giovanni Capraro, fisherman; Castro (Lecce), 02/10/2015).

The terracotta sinkers, “*furticighri*” (DELL’ABATE & MARTELLA, 2015: 114), were produced in the inland areas, generally in those centers traditionally dedicated to the manufacture of pottery. Their shape, similar to a spindle whorl, allowed them to roll, thus preventing the nets from entangling in the seabed. It is relevant that the local term “*furticidhru*” precisely indicates the spindle whorls (ROHLF, 2007: 252). They were basically used for purse-seining or small bottom trawling, a type of fishing near the coast – suitable for sandy and shallow sea beds (15-20 m) – which did not use floats, since the net was dragged by a boat (Fig. 17).



Fig. 17. Terracotta sinkers, so called “*furticighri*”, early 20th century. From Castro (Lecce). Photo by T. Zappatore.

Finally, to anchor the nets, fishermen used rocks drilled with a hole and attached to a rope. Metal rings or stones of various sizes were used to eventually disentangle the nets (Fig. 18).



Fig. 18. Metal ring used to disentangle the nets, early 20th century. From Castro (Lecce). Photo by T. Zappatore.

In the past, there were many different net types, depending on the species being fished and the seabed where fishing took place: a division that is still in use today. Net types utilized at the beginning of the 20th century in the Salento area, with their dialect names, are mentioned in the “fishing” section catalogue of the Ethnographic Exhibition held in Rome in 1911 for the 50th anniversary of the Italian Unification. Among these, we should mention the “*cribio*”, used mainly for *Auxis bisus*, between 56 and 70 m long, equipped with small weights of about 30 grams; the “*cupiddara*”, for the picarel (*Spicara smaris*), between 70 and 168 m long; the “*ritota*” or “*schetti*”, for the saddled seabream (*Oblata melanura*) and the horse mackerel (*Trachurus trachurus*); the “*ntramacchiati*” (trammel net), for red mullet (*Mullus barbatus*), consisting of three nets one above the other fixed together at the top and bottom; the “*squadrata*”, for lobsters (*Palinurus elephas*) and thresher sharks (*Alopias vulpinus*) (GIACOMELLI, 1911: 26-50).

A traditional type of fishing in Salento was the so-called “*piscàre*”, which is practiced even today in places where regularly various schools of fish migrate. These places were very common along the

coast of Salento, spaced about 50 to 60 metres from each other, and were usually given names by fishermen, perhaps due to some peculiarity of the coast itself, for example, a fresh water well (Puzzu Talatu (i.e. water well), Castro, Lecce), or a cave (Rutta du Diavulu (i.e. Devil's Cave, Leuca, Lecce), or a watchtower (Omu Mortu, i.e. Dead Man, Diso, Lecce) and so on. The nets were attached to a spike in the rock and stretched from the shore to the open sea. To signal the end point of the nets, special floating corks (called "camàri") were attached to the nets which also had bells. Their sound was distinctive and different from boat to boat, so as to distinguish the owners of the nets, who therefore proclaimed themselves the temporary owners of that fishing place ("piscàra") (DELL'ABATE & MARTELLA, 2015).

As all of man's relevant activities, fishing had its social aspect too. Normally, the owner of the boat was also the owner of the nets. The

remainder of the crew was made up of workers, usually 2 to 5 people, whose weekly pay depended on the catch. Every Sunday the proceeds from the sale of fish was calculated. Three parts of the proceeds went to the owner: one for the owner, one for the boat, and one for the net. The remaining part was shared among the rest of the crew. The group was close-knit and loyal, and, only in exceptional cases, tended to stay the same year after year. It is noteworthy that there was no written contract to protect the workers, the word given by all parties was as good as law and always honoured. Likewise, there was no written law to prohibit fishing before the fish had the time to lay their eggs and reproduce. Everybody simply respected the life cycle of fish, in order to protect future fishing activities and therefore preserve the abundance of fisheries.

8. Fishing in the Iberian and Greek areas: a comparison

Fieldwork conducted in Salento and information gleaned from archaeological finds were compared with examples of traditional net fishing from other Mediterranean contexts, both current and historical, to highlight any common elements or regional peculiarities. We examined two areas in particular: the Iberian area and the Greek Ionian Islands. The former because Puglia, like the rest of southern Italy, had centuries-old ties with the Kingdom of Spain, the latter because of its geographical proximity.

Useful information on eighteenth-century fishing in Spain can be found in Antonio Sáñez Reguart's philological studies (ca. 1740–1797). His texts and plates provide detailed descriptions of the tools and their uses (Fig. 19). Reguart recalls the recommendation to keep the nets taut when tying knots or carrying out repairs, and also lists the types of nets commonly found in the Iberian Peninsula, types that appear very similar to those of Salento (REGUART, 1793a: 80-111; REGUART, 1793b: 171-217). Significantly, the Sicilian ethnologist Giuseppe Pitrè (1841-1916) described similar precautions in the making and repair of fishing nets in early twentieth-century Sicily (PITRÈ, 1904: 311). These cultural similarities with Spain may have been influenced by the centuries of Spanish domination in the Kingdoms of Naples and Sicily, which also left some lexical and structural affinities in the language.

The comparison revealed substantial similarities with the various fishing techniques observed in Salento. Net maintenance was essential, as they were made of perishable materials. Dyeing, in particular, was so important that it is mentioned in several ancient industrial recipe books as a method for preserving fibers. At the beginning of the twentieth century, Italo Ghersi recommended in his manual the use of a solution composed of two parts Aleppo pine bark and three parts water, a procedure to be repeated every two weeks (GHERSI, 1910: 766).

Net fishing constitutes an intangible cultural heritage, common to many Mediterranean coastal peoples. A significant example is the fishing of goby (*Aphia minuta*) with the boat seine: it is present in Italy, in the Ligurian and Tyrrhenian Seas, as well as in France and Spain. Here, the technique is known in Andalusia as "boliche" – a variant of the "jábega" – widespread throughout the Iberian Peninsula (GARCÍA *et al.*, 1981; MORENO-MUÑOZ *et al.*, 2023). This fishing technique, known as "lavada", has been documented in Huelva and Cádiz since the 16th century (RODRÍGUEZ, 1923: 149, 157-166). It is practiced, with a few variations, in other Mediterranean Spanish coastal areas such as Catalonia, Almería, Valencia, and Alicante. It consists of a tightly woven hemp net lowered from the sea by two boats and then hauled ashore by fishermen to catch species such as anchovies, sardines, and goby.

Net fishing techniques, often similar to those of Salento, are also widespread in Greece. Intriguing is the case of Corfu, an island in the Ionian Sea off the northwestern coast of Greece, just over 250 km from the Apulian coast of Salento, a relevant intermediate station in the Strait of Otranto passage. Here, the prevailing fishing methods were, still at the beginning of the 19th century, nets, such as the *gripas*, a trawl method, and the *pezovolo*, a circular net with weights used in shallow waters (VLASSOPOULOS, 1977: 24; SBONIAS, 2022: 441-442, figure 3). As in Salento, fishing in the Ionian Islands also has a tradition that dates back to antiquity. Evidence of fishing dating to the end of the 8th millennium BC was found at the site of Canal d'Amour at Sidari in Northern Corfu. Here, in addition to a fishing tool made of bone, re-

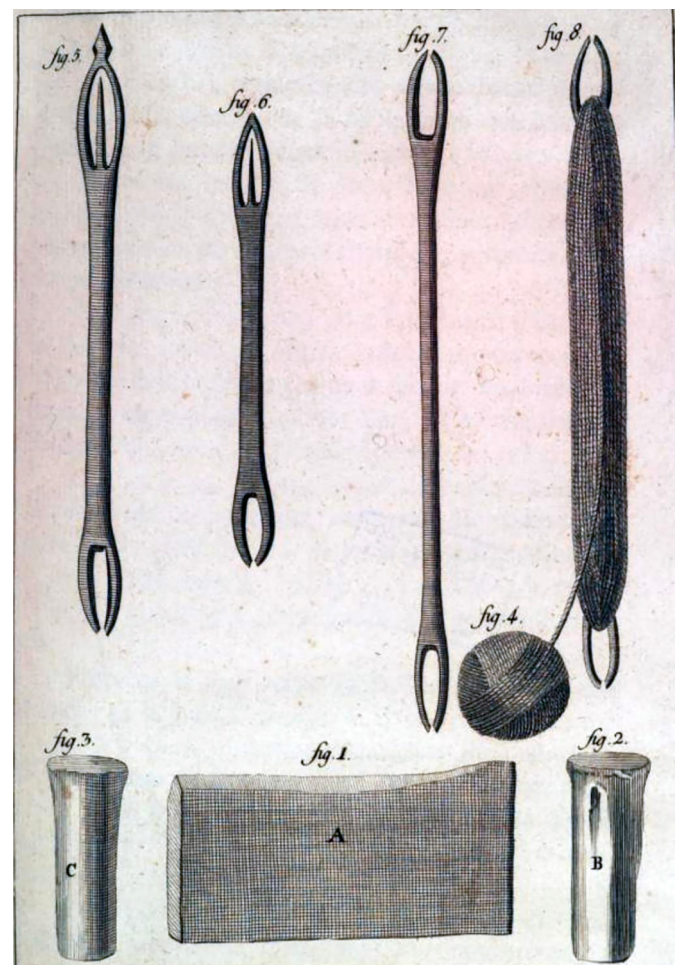


Fig. 19. 18th century netting tools from Spain. From REGUART, 1793a: 82.

mains of numerous fish species have been identified, such as gilthead sea bream (*Sparus aurata*), flathead grey mullet (*Mugil cephalus*), bluefish (*Pomatomus saltatrix*), eels, and european seabass (*Dicentrarchus labrax*) (THEODOROPOULOU, 2007: 76-77; SBONIAS, 2022: 439). The importance of fishing in the classical age, especially tuna, is recalled by authors such as Oppian (*Halieutica*, 6.637-648) and Pausanias (*Phocis*, 9.3-9.4).

Finally, in the interpretative analysis of fishing-related tools, an effect linked to possible cultural convergences should not be over-

looked. According to a phenomenon long recognized in anthropological studies, different cultures can similarly express certain traits, even in the absence of diffusion or historical contacts, and therefore independently (GOLDENWEISER, 1913: 260-261, 276-290). An example is the parallel in form and use of the netting tools between Mediterranean and Omani fishermen of the Arabian Peninsula; it should be noted, however, that the same similarity was not observed in net sinkers (Fig. 20).

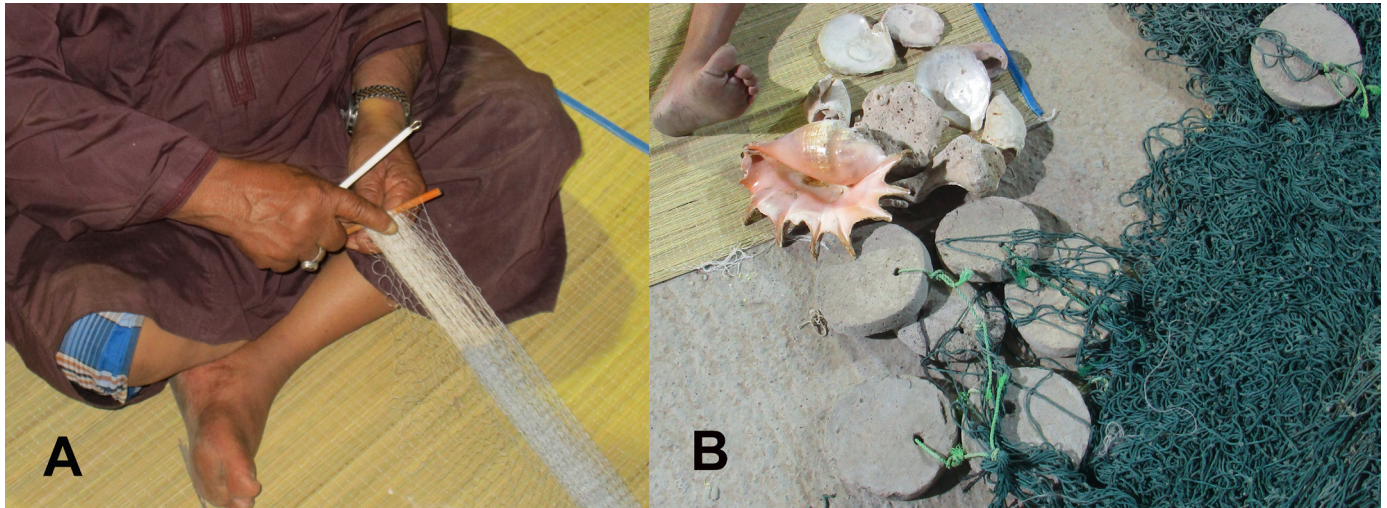


Fig. 20. Sultanate of Oman, Muscat, 2016. A: Use of netting tools in net repair. B: Fishing net with stone sinkers. Photo by C. Giardino.

9. Conclusions

Fishing has always been a fundamental activity for providing humans – at least those living in coastal areas – with the food resources available in the sea. To practice it, communities have developed techniques, tools, and social strategies aimed at catching fish in the most efficient and productive way. This fundamental socioeconomic role has made fishing a way of life for coastal populations, while also creating a cultural heritage that allows this knowledge to be perpetuated through generations as a fundamental shared value to be passed down.

The “technical gesture” and the “use of the tool” (as defined by Leroi-Gourhan) are an integral part of this cultural heritage that is, in practice, the ability of the hand to master a specific technique by manipulating certain instruments (LEROI-GOURHAN, 1977: 284). Any craft activity necessitated a sophisticated body of knowledge and a refined set of technical skills, which were transmitted from practitioner to practitioner and frequently exhibited variations from one individual to another and from one workshop to another. Indeed, even the process of becoming a craftsman could be codified, and access to knowledge was sometimes limited to within a family unit (COSTIN, 1998, 2001).

Technological innovations, especially in boats, have significantly expanded the ability to exploit marine resources since the middle of the last century. They simultaneously led to the loss of the millennia-old knowledge that was part of the local people’s collective memory (MORENO-MUÑOZ *et al.*, 2023: 4573-4574).

Ethnological data allow us to understand the exact functions of archaeological finds connected to the specialized field of net fishing. Some examples are the filets or shuttles that point out a local activity

of net manufacturing and repair, or the sinkers similar to the spindle whorls that refer to gill netting. Furthermore, the presence of nets implies a whole series of activities that did not leave archaeological traces, such as dyeing the nets to facilitate fishing and avoid string rotting.

Today, as in the past, the traditional fishing techniques in a definite area are necessarily based on the systematic exploitation of the local resources offered by that territory. Therefore, the traditional methodologies’ knowledge of a specific region allows us to reconstruct with sufficient reliability the complex operational chain linked to net fishing. Just think of the cultivation, harvesting, preparation, and spinning of the vegetable fibers used in the manufacture of the nets, the net making by creating knots, a technique passed down from one generation to another. Once made, the nets had to be dyed – with the consequent search and preparation of useful types of wood –, then dried and finally put into use. These operating chains, implicit in net fishing, were an integral part of the social and cultural structure of the past communities: they consisted of knowledge, actions, and gestures that, being immaterial, did not leave evident archaeological evidence. Since they are a characteristic intangible cultural heritage, they are in danger of being lost.

Traditional net fishing is a social activity that involves many individuals of a community, often also linked by familial relations. Ethnological surveys in Salento have shown the involvement of whole families in the various working phases, regardless of gender or age. Some types of fishing, like gill netting, presuppose the synergistic collaboration of several individuals, in a hierarchical social activity made up of standardised and repetitive gestures, culturally characterised. It is precisely this traditional knowledge, part of an intangible heritage, which makes and has made fishing possible.

In the past, as today, this heritage, otherwise lost, was transmitted from generation to generation, constantly recreated by the communities in close correlation with the surrounding environment and its history. It allowed both communities and individuals to develop a sense of social and cultural belonging.

The ethnographic evidence collected in a specific territory, compared with the study of local archaeological finds, provides concrete indications of an intangible cultural heritage and thus allows us to obtain a more realistic and concrete image of the daily life of past communities.

The comparison with ethnological analyses carried out in other countries, such as Spain and Greece, allowed us to observe how many fishing tools and techniques are repeated across space and time, without substantial differences.

The three Mediterranean regions examined are connected by historical and geographical ties. However, it should be considered that they share many cultural elements, thanks to their common membership in antiquity to the Greco-Roman world, well represented by the mutual derivation of the Italian and Spanish languages from Latin. It is therefore necessary to consider whether the elements that unite the three areas are connected to a shared original tradition. A good example is the Iberian double-forked netting needles illustrated by Reguart at the end of the eighteenth century, that is analogous not only to modern, similar materials from Salento but also to archaeological finds from Egnatia dating back to the Roman period (figs. 5-6).

The archaeo-anthropological study of fishing in the Mediterranean, with its traditional techniques and tools, therefore provides significant evidence not only of convergence between geographically distant territories but also of the survival of cultural elements that have come down to us from a millennial past.

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