

SHELL AND BONE ORNAMENTS FROM THE PADRU JOSSU *HYPOGEUM* IN SANLURI (SARDINIA, ITALY)

Los objetos de adorno en concha y hueso de animal del hipogeo de Padru Jossu, Sanluri (Cerdeña, Italia)

CLAUDIA PAU*

ABSTRACT In this article I discuss personal ornaments made from shell and hard osseous materials from animals dating from the Bell Beaker Period at the Padru Jossu *hypogeum* in Sanluri (Sardinia, Italy) and currently held in the Museo Civico Archeologico Villa Abbas of Sardara. A complete study of these ornaments has been carried out (morphological, technological and functional) to understand the manufacture processes involved in their production, their function, their social meaning and role, as well as their provenance.

Keywords: Bell Beaker, Personal Adornment, Morphological Study, Technological Study, Functional Study.

RESUMEN En el presente trabajo hemos examinado los adornos personales en conchas y en hueso de animal del período Campaniforme del hipogeo de Padru Jossu, Sanluri (Cerdeña, Italia) actualmente conservados en el Museo Civico Archeologico Villa Abbas de Sardara. Se realizó un completo estudio de este material (morfológico, tecnológico y funcional) para comprender el proceso de fabricación, su uso y su significado social.

Palabras clave: Campaniforme, Objetos de adorno personal, Estudio morfológico, Estudio tecnológico, Estudio funcional.

* Universidad de Granada, Departamento de Prehistoria y Arqueología. claupau@ugr.es
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INTRODUCTION

The Padru Jossu *hypogeum* in Sanluri (Sardinia, Italy) comprises a rectangular underground chamber (5.10 × 3.80 m) with rounded corners and oriented East to West. It was found without its roof and possessed two small niches, the first with a semicircular plan. The second niche had a semi-elliptical plan (1.42 m length and 0.41 m breadth). An altar was found in the northwest of the hypogeum, cut into the irregularly shaped rock (2.15 m length, 1.25 m breadth and 0.16 m height) together with a gutter (37 cm length and 5-7 cm width) (Ugas, 1998:262).

The Monte Claro Culture tomb would have been used by the successive generations until the Bronze Age. The bones from the Monte Claro burials would have been carefully collected the new inhumations were put in place in Campaniforme (Bell Beaker) A (stratum III), after the ground was covered with a layer of stones. Burials continued to be numerous in the most recent Campaniform B phase (stratum II). International Bell Beaker vessels first appear in stratum III. They are decorated with horizontal bands, with incised decoration in horizontal geometric bands as well as elements without decoration. The fine walls of these vessels are well smoothed. They occur with finds consistent with the Bell Beaker package including a copper dagger, an archer's bracelet and six flint microliths. The ceramic material in stratum II was without decoration but also included characteristic Bell Beaker grave goods including a copper dagger and an arrowhead, three archery bracelets and, ten obsidian microliths. Ornaments have been found both strata (Pau, 2012, 2016; Ugas, 1982:19-25, 1998:261-280).

A recent study on the human bones has provided more details about the chronology of the Padru Jossu site including calibrated dates (Oxcal 4.0.) (Lai, 2009). The Monte Claro Culture lies between 2561 and 2234 BCE, a phase called Campaniform (Bell Beaker) A by Giovanni Ugas while Luca Lai's ascription of Campaniforme (Bell Beaker) lies between two other dates, 2463 and 2155 BCE. Dates of 2461-2152 BC and 2430-2044 a.C. (tab. 1) have been obtained for the most recent phase called Campaniform (Bell Beaker) B by Giovanni Ugas and Bonnanaro A by Luca Lai.

TABLE 1
CHRONOLOGY OF THE HYPOGEUM OF PADRU JOSSU, SANLURI
(Table made using Luca Lai's study, University of Arizona analysis) (Lai, 2009: 318, Tab. 1)

<i>Cultural attributions according Ugas</i>	<i>Cultural attributions according Lai</i>	<i>#Lab</i>	<i>BP</i>	<i>Error</i>	<i>Range 2σ cal BC</i>
Monte Claro	Monte Claro	AA72790	3912	42	2561-2234
Campaniforme A	Campaniforme	AA72152	3845	41	2463-2155
Campaniforme A	Campaniforme	AA72153	3843	41	2463-2155
Campaniforme B	Bonnanaro A	AA72791	3837	41	2461-2152
Campaniforme B	Bonnanaro A	AA72792	3790	41	2430-2044

According to Giovanni Ugas (1998:276-277), the Padru Jossu hypogeum must have been a tomb-sanctuary, controlled by an elite group. We also suggest that animal sacrifice was carried out in this space as attested by the recovered animal bone remains and by the presence of the gutter placed on the altar.

MATERIAL AND METHODOLOGY

A total of 2.052 ornamental items made from hard osseous material were found in the Padru Jossu *hypogeum* by Giovanni Ugas (Ugas, 1982, 1998). These items are currently held in the Villa Abbas Civic Archaeological Museum of Sardara (Sardinia, Italy) and have been studied. The objects have been examined macroscopically and microscopically (20× binocular lens, 50× binocular lens, a 200× optical microscope and the SEM scanning electron microscope) and comparisons were made between the archaeological material and private and public faunal collections comprising various animal species. Otherwise, the nomenclature of the CLEMAN database has been used for shell species and general texts have been consulted (Saunders, 1991; Poppe and Goto, 1991).

RESULTS

Typological study and classification

The 2.052 artifacts studied have been grouped into three typological categories (pendants, beads and buttons), following previous classifications (Barge, 1982; Uscatescu, 1992; Bonnardin, 2009; Pascual, 1998; Barciela, 2008; López Padilla, 2011; Pau, 2016). In addition, in the first category, pendants, six morphological groups have been distinguished. Three groups have been identified in category II, beads and category III, buttons, comprises a single and relatively uniform group (fig. 1).

Pendants (category I)

Pendants are defined here as objects of elongated shape, usually perforated and hanging or hanging. Their height is always greater than their breadth and their perforation (or other means of suspensión) lies at one of the ends (Pau, 2012, 2016). Group I comprises whole shell pendants (group 1) (vig. 2) and include 65 artefacts that conserve the natural anatomical morphology of the shells of marine mollusks, gastropods (three of *Cypraea lurida*, 50 of *Columbella rustica*, 10 of *Conus mediterraneus*) and bivalves (two of *Cerastoderma edule*). All these objects present with one or more intentional perforations that can be circular, oval or irregular in shape.

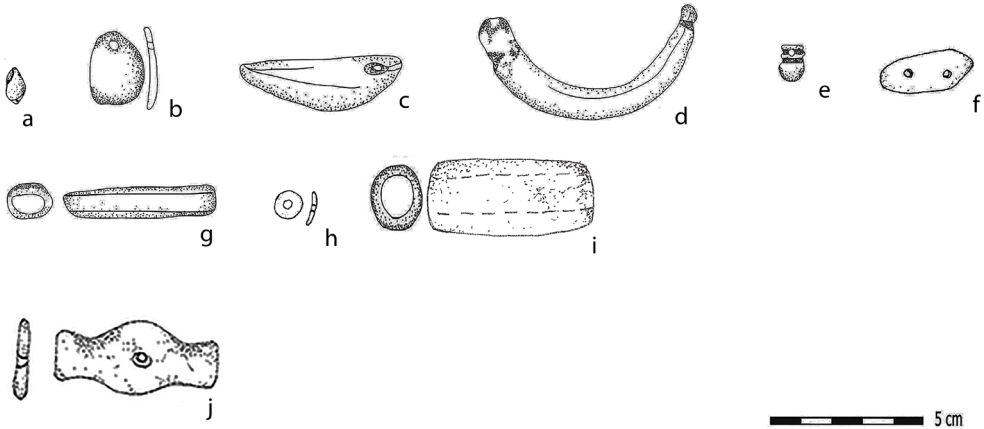


Fig. 1.—Category I: a. group 1, b. group 2, c. group 3, d. group 4, e. group 5, f. group 6; Category II: g. group 1, h. group 2, i. group 3; Category III, j. group 1 (Pau, 2013:13; 2016:lam CLI, CLV, CLXXIII).

The laminar shell pendants (Group 2) comprise 1.605 pieces (fig. 2). These ornaments were produced by working the bivalve exoskeleton (*Cerastoderma edule*). They have an elongated, elliptical, or sub-elliptical morphology, perhaps subtriangular, subrectangular, sub-trapezoidal, sub-circular, or sub-polygonal. The section may be flat, plano-convex or concave-convex and they usually have an eccentric perforation at one end. Their perforation is round with a truncated cone section (92%) that may be cylindrical or irregular. There are 83 pendants made of whole teeth (Group 3) (fig. 2). These 83 teeth come overwhelmingly from canids (*Vulpes vulpes*) and conserve the natural morphology of the tooth. They are perforated transversely to the major axis through the root end. There is one bear (*Ursus arctus*) with two holes, one through the root and a second orthogonal hole through the back, creating a perforation in the form of a “lambda” or upside down ‘V’-shape (Ugas, 1998).

Group 4 comprises crescent pendants or pendants in the shape of an arch (fig. 2). This group includes 11 ornaments made from the unsplit mandibular tusks of *Sus scrofa sp.*, which may have a natural (8 pieces) or artificially (3 pieces) arched shape. There are several methods of fastening these pendants: two drilled holes at one of the ends, one or two holes in the central part, and grooves that may or may not be associated the holes.

Group 5 consists of three heart-shaped pendants. The bodies of these pendants are semi-circular and each piece has an extension to facilitate suspension that is quadrangular with two grooves and central perforation. The combined form of the body and the extension creates a small heart-shape (Ugas, 1998).

We placed a fibula-pendant in Group 6. The ornament has an elliptical shape with a flattened section and a double functional perforation.



Fig. 2.—Pendants and beads of the hypogeum of Padru Jossu, Sanluri.

Beads (category II)

Beads are defined here as loose elements that have a width greater than or equal to their length and central perforation always running through the long axis of the object (Pau, 2016).

The whole shell beads (Group 1) consist of two ornaments obtained by conserving the natural anatomical morphology of the carapace of a scaphopod of the genus *Antalis* and the family *Dentaliidae*, taking advantage of its natural perforation.

Discoidal beads (Group 2) number 278 small elements (fig. 2) with discoidal morphology obtained from bivalve valves (*Cardiidae* and *Glycymerididae*). The surfaces are round with straight edges and a round, central perforation with either a bi-conical section (95%) or cylindrical section (5%).

Beads in Group 3 appear in the form of a barrel. It belongs to group 3, Beads in the form of a barrel, barrel or cone were made from the exoskeleton of a bivalve of the genus *Spondylus*, family *Spondylidae*, with flat limbs, a round, central perforation and a cylindrical section, longitudinally its maximum axis.

Buttons (category III)

Three objects are grouped under buttons. Because of their formal similarities with modern buttons these objects have been attributed the same function.

Buttons are defined here as having lateral appendices (Group 1). Three pieces have a central body (circular and elliptical) and two trapezoidal lateral appendices. Of these, two buttons have two holes that join in “V” on the inner side, while the third button presents with a very flattened body and a single central perforation with a cylindrical section.

The raw material

The preferred raw material for making ornaments was shell (1.951 specimens) from bivalves (*Cerastoderma edule*, *Glycymeris glycymeris*, *Spondylus*), gastropods (*Columbella rustica*, *Cypraea lurida*, *Conus mediterraneus*) and scaphopods (*Antalis*). The objects manufactured from the hard-osseous material from vertebrates comprise 100 ornaments: *Sus scrofa* tusks (10 specimens), teeth (83) and animal bone (7). The ornaments in bone were obtained by working bones from caprinae, bovids and suids.

Many of the ornaments were badly preserved, with worn surfaces, micro-holes and concretions. Their natural color has been altered and become friable. The degree of transformation can be of varying intensity, the greatest transformations having been found in one of the necklaces. These modifications were surely caused by different factors (weathering, precipitation of calcium carbonate and also by the acidic pH of the soil). More precisely, it is possible to determine whether these natural modifications are subsequent to anthropic modifications since they could be the product of water fluctuations within the *hypogeum*, combined with a high level of calcium carbonate in the environment.

Technological study

Of the whole shell pendants, the gastropod shells had a perforation in the back or in the last turn, obtained using different techniques including: abrasion, indirect percussion or direct pressure. In bivalve valves the hole is round and made by abrasion on the apex of the shell using a hard object as can be seen examining by the outer surface which is more worn down than the inner surface. The process of producing a hole could have been completed by direct pressure to be able to control better the dimensions, as verified by experimental studies. The scaphopod beads have a longitudinal perforation where the mollusk lived. It is possible that one of the ornaments eroded naturally, as has been observed in other cases (Barciela, 2008:89-94), while in the other such object from Padru Jossu, observing the profile under the microscope, it has been confirmed that it was cut with sawing.

Laminar pendants are fragments of shell exoskeleton that were transformed by natural factors. In the best-preserved pieces, the ribs of the shell are still visible. In a few cases (2%) thin striations have been identified on the edges as well as bright spots, although the deterioration of the material does not allow us to decide whether we can attribute these phenomena to the regularization of the edges by

abrasion or to the use of the ornaments. In 92% of the cases, the perforation has a truncated cone section made with some kind of bow-drill (fig. 3).

The discoidal beads that were studied were all finished elements and, therefore, the first stages of elaboration could not be identified in the traceological analysis. Only on the surface of three artifacts has it been possible to identify traces of the technological processes connected to the last stages of manufacturing, removal of material using abrasion and polishing. In some of the discoidal beads (30% of the cases examined) the perforation could be bi-conical, uni-conical with the latter being produced from the ventral side.

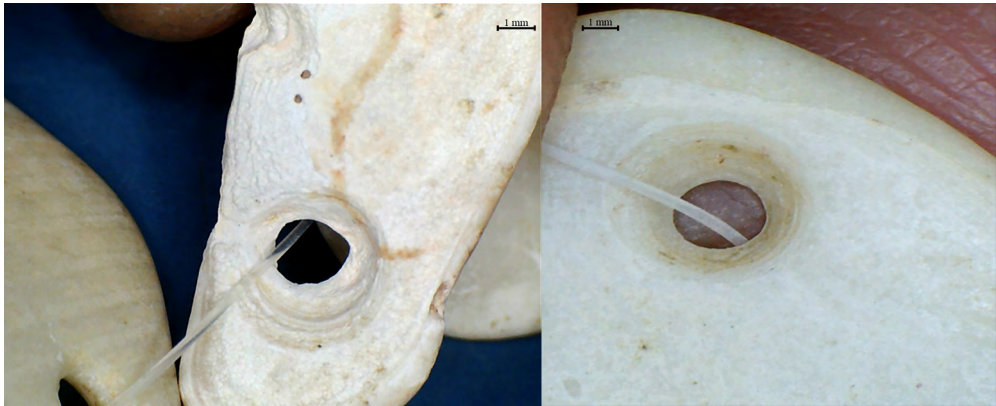


Fig. 3.—Particular of the perforation of two laminar pendants in shell.

The study of objects made in bone under a microscope proved impossible because the surfaces were damaged as well as because of the presence on the surface of glues and resins used in restoration and by the presence of lacquer used to write on these pieces.

The *Sus Scrofa* tusks (the support) was pierced directly with a perforator and the grooves used for suspension were made by cutting the tusk. The transformation of the teeth of canids consists of a bi-conical perforation through the canine, obtained with mechanical rotation of a pointed tool on each face. The surface of the arched pendants obtained by transformation of the *Sus scrofa* tusk, display fine abrasion striae from the final refining phases of the object's manufacture.

Function

The poor state of conservation of the artefacts from the Padru Jossu *hypogeu*m has made functional analysis of use wear traces difficult. Use wear has been identified in only a few cases. Four of the crescent pendants, three that retain the natural arched shape of the tusk and one that was completely transformed (fig. 4)

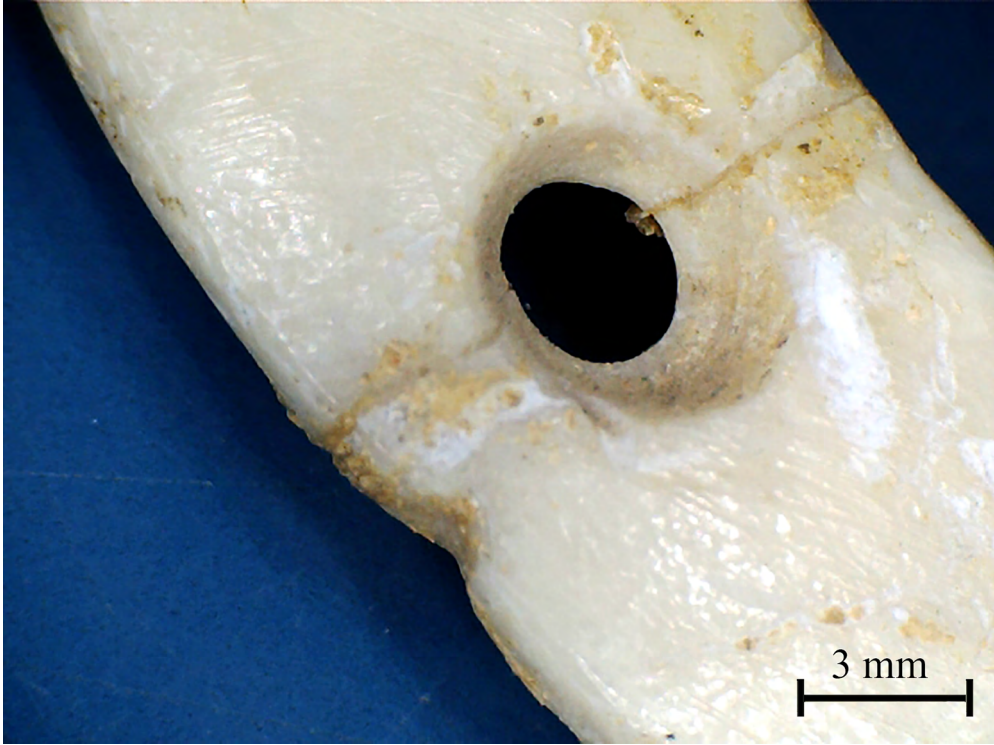


Fig. 4.—Use wear and use technological wear in a crescent moon pendant.

retained significant areas of use in notches near the drilled holes. From the position of the notches and, in some cases due to the presence of grooves, it can be suggested these pendants were suspended so the points fell downwards. The presence of a deep notch on the edge of the pierced end of the bear tooth pendant demonstrates without a doubt that this ornament was fastened with a cord. The adornment that we have defined as a fibula-pendant may have had several functions, that of a simple pendant, of a fibula or of a separator of strands of a necklace, creating a double row of cords. There are ethnographic parallels as in the case of the Tautau of New Guinea (Alfaro *et al.*, 2001:87). The piece also displays another interesting feature. In addition to the two central holes, part of a third hole is still visible on the edge. The deterioration of this ornament does not permit us to draw clear or reliable inferences although considering that the partial hole has the same diameter as the hole closest to it while the central hole is larger, it may be possible that the pendant was first used in an upright position taking advantage of the two small holes and then used secondarily in a horizontal position when one of the two initial holes broke and it was necessary to create another one.

DISCUSSION AND CONCLUSIONS

In this work some 2.052 objects of personal adornment made from shell and hard osseous materials from animals have been examined. Three different categories of ornaments; pendants, beads and buttons have been distinguished. These categories were further divided into subgroups.

In the Campaniform (Bell Beaker) A (stratum III) we find whole shell pendants, laminar shell pendants, whole tooth pendants, crescent pendants, the heart-shaped pendant and whole shell beads, discoidal beads and barrel beads. In the most recent Campaniform (Bell Beaker) B phase (stratum II), the same groups of pendants are still present although the number of crescent-shaped or arched pendants increases markedly and a new form also appears, the fibula-pendant (group 6). Category III (buttons) also appears at this time. Among the beads, the same groups continue to appear with the exception of the barrel beads that disappear.

The varieties of objects preserved in the *hypogeum* also appear in other European Bell Beaker contexts. In addition, from the morphological study, it has been found that the ornaments from Padru Jossu are already present in the native Sardinian cultural substrate (discoidal beads, barrel, pendants and whole shell beads, shell pendants and crescent tusk pendants), these elements have been called “traditional ornaments”. Likewise, new elements appear with parallels with objects found in the European area of development of Bell Beaker and post Bell Beaker phenomena, such as ‘buttons’. There is a final group of ornaments from this site for which we do not find parallels in the pre-Bell Beaker cultural tradition in Sardinia, and which at the same time, do not characterize the European Bell Beaker tradition, are the “unique ornaments”, such as the heart-shaped pendant that has parallels on Sardinia with other small objects from the same period that were found in the hypogeic-megalithic tomb of Bingia è Monti, Gonnstramatza (Atzeni, 1998; Pau, 2012, 2016).

The shells used to make the Padru Jossu *hypogeum* jewelry derive from species of mollusks that live in the temperate waters of the Mediterranean and would therefore represent an abundant natural resource on the coasts. In most cases, it seems that the shells were collected post mortem on the seashore, with the sole purpose of using the exoskeleton as a raw material. The ornaments manufactured from teeth and animal bone were obtained from caprinae, bovids, suids, species that were present according to the zooarchaeological reports on the faunal remains from the *hypogeum* (Sorrentino, 1982). However, the use of hard osseous from other species of other mammals including fox and bear, otherwise not present in the faunal material, is also attested in the ornament assemblage.

The traceological study was hampered by the poor state of preservation of the objects and only in some cases was it possible to identify the last stages of manufacture or the methods used to perforate the ornaments. In addition, clear use patterns have been identified in only five objects (crescent pendants and the bear tooth pendant). The use wear suggests these objects at least were used when the deceased was alive before they were deposited in the grave during the funerary ritual. Giovanni Ugas

also theorizes that these necklace ornaments from Padru Jossu could be objects offered to some divinity, possibly feminine, venerated in the hypogeo-sanctuary (Ugas, 1998:279).

We also highlight the use of *Sus scrofa* tusks as pendants, probably used as central elements in necklaces or bracelets. These tusk pendants, which may be connected to the importance and symbolism of hunting this dangerous prey animal could reflect on the strength and masculinity of the hunter; this might be thought of as an initiation rite for young people, a test of courage and the tusk could have been considered, in that case, a hunting trophy. The wild boar has great significance whether as an animal to venerate and to eat. Today in Sardinia, Sardinian hunters call it Su sirbone mannu, the adult male, and consider it a worthy antagonist (Franco, 2009:81-87).

The teeth of canids could also have been used as pendants because they were considered hunting trophies or the memory of a pet (Barge, 1982:83). In their shape they resembled small horns could have been used as protective amulets (Lilliu, 1999:148-149) or they could have been connected to manhood.

The objects of personal adornment deposited in the Padru Jossu *hypogeum* may also have reflected symbols of power representing and protecting the social status of the individuals deposited there, something also demonstrated by their association with objects made from elephant ivory, now being studied.

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