

## **Distribution and consumption of fluorite and translucent beads in the Iberian peninsula from 6<sup>th</sup> to 2<sup>nd</sup> millennia BC**

*Distribución y consumo de cuentas de fluorita y translúcidas en la península ibérica  
del VI al II milenios ANE*

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**Supplementary file**

**Archivo suplementario**

**SF2 Contexts of the sites studied and reported in the text**

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**Casa da Moura (Óbidos, Leiria)** natural cave was used for a long-term occupation from the Ancient Neolithic to historical times. Its funerary sequence, with a MNI of 90 (Silva 2003: 57), ranges from the 4<sup>th</sup> to 3<sup>rd</sup> millennia BC (Carvalho and Cardoso 2011: 395-396). This cave accounts for a large material assemblage, that includes Neolithic and Chalcolithic pottery, polished axes and adzes, flint blades and some flint halberds and daggers, bone hairpins, beads of different raw materials, cylindrical and schist-plaque idols, etc. (Cardoso *et al.* 2002).

**Poço Velho (Cascais, Lisbon)** natural caves were excavated in the last decades of the 19<sup>th</sup> century (Gonçalves 2009). Although their funerary sequence ranges from the second half of the 4<sup>th</sup> to the end of the 3<sup>rd</sup> millennia BC, Bronze Age, Iron Age and historical phases were also recorded (Gonçalves 2009). Most of the recovered materials lack stratigraphic and contextual information. Cardoso *et al.* (2012) express reservations regarding a fluorite bead, citing Paço *et al.* (1959: 157). This bead and a translucent-pink bi-conical bead from assemblage IGM-356 (Gonçalves 2009: 367-369) were selected for study.

**Alto da Feteira (Pombal, Leiria)** megalithic monument with polygonal chamber and corridor was partially destroyed and violated before its excavation in the 1960s (Castro and Ferreira 1970). Most of the materials were recovered in the central part and the entrance of the chamber (zone 2). The material assemblage is characteristic of the 4<sup>th</sup>-3<sup>rd</sup> millennia BC transition: shell bracelets, flint blades, arrowheads and geometrics, two flint halberds, some polished stone axes, hemispherical and carinated bowls, etc. (Castro and Ferreira 1970). A broken decorated 'quartz' bead was published among the other 143 beads recorded (Castro and Ferreira 1970: 43).

**Leceia (Oeiras, Lisbon)** fortified site possesses a domestic and productive sequence from the Late Neolithic until its abandonment at the end of the 3<sup>rd</sup> millennium BC (Cardoso 1994, 1998) and a large assemblage of exotic objects acquired via long distance exchange, such as ivory (Schuhmacher and Cardoso 2012). The green fluorite bead published by Cardoso *et al.* (2012: 37) was recovered in layer C3 with other greenstones, mostly variscite (Odriozola *et al.* 2013b), dated in the second half of the 3<sup>rd</sup> millennium BC.

**Vila Nova de São Pedro (Azambuja, Lisbon)** 3<sup>rd</sup> millennium BC fortified site was excavated between the 1930s and the 1960s (Arnaud 2005). No contextual information is available for the bead assemblage, artificially composed into several necklaces by Paço (1939, 1942, 1943).

**Lapa do Bugio (Sesimbra, Setúbal)** natural cave shows a long-term occupation from the Ancient Neo-

lithic to the Iron Age, including important sequences of funerary use during the 4<sup>th</sup>-3<sup>rd</sup> millennia BC (Cardoso *et al.* 1992). Unfortunately, scarce contextual information is available for the recovered materials, which include the two green fluorite beads presented by Cardoso *et al.* (2012: 38).

**São Paulo 2 (Almada, Setúbal)** artificial cave consists of a 7.5 m diameter chamber and a short corridor 2.5 m in length (Barros and Espírito Santo 1997: 218). The funerary sequence ranges from the Late Neolithic to Late Copper Age, accounting for a MNI of 254 (Gonçalves *et al.* 2004: 77). A 1<sup>st</sup> millennium BC habitational phase altered the 4<sup>th</sup> - 3<sup>rd</sup> millennia BC sequence.

The findings are typical of Iberian Late Prehistory. They include geometric lithics and polished axes and adzes, engraved schist plaques, plates, spherical and carinated bowls, a zoomorphic vase, and abundant beads in earlier phases, and arrowheads, calcite cylindrical idols, "Palmela-type cup" and other Chalcolithic pottery typologies, perforated V buttons, beads in different raw materials (including 2 beads in amber and greenstones), some copper objects and a gold-leaf bead for the second phase (Barros and Espírito-Santo 1997: 218-219; Barros 1998; Gonçalves *et al.* 2004). The authors state that in the second phase they recovered a 'hyaline quartz' bead and a 'translucent greenish' bead decorated with zigzags (Barros and Espírito-Santo 1997: 219)

**Anta 2 do Vidigal (Montemor-o-Novo, Évora)** consisted of a circular chamber c. 3 m in diameter formed by 6 orthostats, and an oval corridor 1.80 m in length. Excavated by M. Heleno in 1936, presents a rich grave goods assemblage chronologically ascribed to the late 4<sup>th</sup> millennium-early 3<sup>rd</sup> millennium BC: spherical and hemispherical bowls, polished axes, flint arrowheads, engraved schist plaques, etc.<sup>1</sup> We have recorded a total of 18 schist discoidal beads and one trapezoidal translucent bead for this site.

**Olival da Pega 1 (Reguengos de Monsaraz, Évora)** is a megalithic monument with polygonal chamber formed by 7 orthostats, one of them reaching 4.4 m high (Leisner and Leisner 1985). Half of the numerous human remains documented were reported as partially burnt or affected by fire at different levels and temperatures, as well as some of the material assemblage of the funerary deposit (Leisner and Leisner 1985: 165-166). The referred items evidence a diverse and rich funerary deposit from the 4<sup>th</sup> to 3<sup>rd</sup> millennia BC transition, including decorated and symbolic pottery,

<sup>1</sup> L. Rocha, "As origens do megalitismo funerário no Alentejo Central: a contribuição de Manuel Heleno". Dissertação de Doutoramento apresentada à Faculdade de Letras da Universidade de Lisboa, 2005, p. 383.

globular and hemispheric bowls, plates, carinated bowls, a diverse flint assemblage of arrowheads and blades, polished axes, large quantity of plaque idols, bone hairpins, two lagomorphic pendants and c. 1000 beads. Additionally, a spherical bead and a small pendant, described as quartz, were recorded (Leisner and Leisner 1985: 148, est. XXIII: 91 and 92).

**Anta Grande da Comenda da Igreja (Montemor-o-Novo, Évora)** is a monumental megalithic passage grave, with collective burials, in use from the late 4<sup>th</sup> millennium BC to the first half of the 3<sup>rd</sup> millennium BC (Whittle and Arnaud 1975: 7). Its architecture consists of a polygonal chamber (4.5 m in diameter and 6 m in height) formed by eight orthostats and a long passage c. 10 m in length in two sections. The mound is preserved up to c. 3.5 m in height.

First excavated in the late 19<sup>th</sup> century, it has been the object of several excavations in the course of the twentieth century (Leisner and Leisner 1959). The recovered pottery assemblage is typical of the Iberian 3<sup>rd</sup> millennium BC, with small carinated bowls, cups and plates. The excavations also recovered polished axes and adzes, some bladelet cores in flint and hyaline quartz, several flint blades, microliths, a set of c. 200 arrowheads shaped from different raw materials and in very diversified typologies, flint halberds and daggers, several dozen engraved schist plaques, sandstone plaques, engraved schist crosses, bone “hair-pins”. and a set of beads of different shapes made from various raw materials, including a zoomorphic schist pendant, two glass beads (possibly Iron Age), green beads (talc, muscovite and variscite), lignite beads, several amber beads of different typologies (Odriozola *et al.* 2019) and the translucent and fluorite beads reported here.

**Casal do Pardo/Quinta do Anjo necropolis (Palmela, Setúbal)** is formed by four hypogea with circular chamber and corridor, excavated firstly by António Mendes and Carlos Ribeiro in 1876 and 1878, although other materials were recovered before those interventions (Soares 2003: 22; Gonçalves *et al.* 2018). Its main funerary occupation seems to have taken place in the 4<sup>th</sup> to 3<sup>rd</sup> millennia BC transition and the second half of the 3<sup>rd</sup> millennium BC (Soares 2003). A complete revision of the necropolis and inventory of the materials were made by the Leisners (Leisner *et al.* 1961; Leisner and Leisner 1965). A “yellowish-white” quartz bead in necklace QAP-199 was published among other materials with no contextual association (Leisner and Leisner 1965: 134, *tafel* 120: 16). Although uncertain, the context for these beads was according to Soares most likely hypogeum 4 (Soares 2003: 63-66).

**Gruta 2 de Alapraia (Cascais, Lisbon)** forms part of a necropolis of four artificial caves. It was excavated in 1934 by Jalhay and Paço (1941), and consists of

an hypogeum with circular chamber and corridor. Despite later uses, the cave was in use during the Late Neolithic-Chalcolithic. Calcareous symbolic items and idols were recovered in the funerary level, as well as an important set of bell-beaker pottery (Jalhay and Paço 1941; Leisner and Leisner 1965). A ‘rock crystal’ bead was reported within its grave goods (Jalhay and Paço 1941: 127; Leisner and Leisner 1965: 94; *tafel* 70: k).

**Tituaria (Mafra, Lisbon) tholos** was excavated in 1978. Under a poorly preserved mound, its architecture consisted of a circular chamber with a maximum diameter of 4.6 m, a corridor c. 4 m long and a simple atrium. The only radiocarbon date available (OxA-5446: 3995 ± 65 BP) was taken from individual H27 in the ‘foundational’ deposit of the chamber (Cardoso *et al.* 1996: 172). In this level, several beads were found among other human remains packaged close to the chamber’s eastern wall. In association with individual H20 in the same layer of H27, were described a pottery fragment and a “calcite” bead (Cardoso *et al.* 1996: 148).

**Trigache 3 (Odivelas, Lisbon)** was excavated by Carlos Ribeiro in the late 19<sup>th</sup> century together with another three dolmens (Leisner and Leisner 1965: 20-26; Boaventura 2009: 92). Trigache 3 finds include typical materials from the first half of the 3<sup>rd</sup> millennium BC, such as polished axes, flint arrowheads and blades, a calcareous fragment of lunula, bell-beaker pottery, bone hairpins and some beads. The Leisners referred to a translucent calcite bead within this assemblage (Leisner and Leisner 1965: 24; *tafel* 18: 51).

**Anta dos Penedos de São Miguel (Crato, Portalegre)** was excavated from 1981 to 1983 (Claustre *et al.* 2005). Its architecture consists of a polygonal chamber c. 6 m in diameter and a corridor c. 10 m long, under a circular mound c. 16 m in diameter, which were relatively well preserved. Despite later Roman use and medieval violation of the chamber, the materials evidence a funerary use during the late 4<sup>th</sup> millennium and early 3<sup>rd</sup> millennium BC (Claustre *et al.* 2005). ‘Quartz’ beads were described among the raw materials used for the ornamental items recovered.

**Gruta da Marmota (Alcanena, Santarém)** cave was explored in the 1970s, yielding an assemblage of materials chronologically ranging from the Middle Neolithic to the Iron Age. It also contained a Bronze Age funerary use (Gonçalves 1972). An unpublished spherical green translucent bead (MR/S-25) was recovered in the Cut 1 from Sala 2 in the 1974 fieldwork, and another unpublished green translucent bead (MMT-26) was recovered during superficial surveys in the 1990s.

**Buraca da Moura de Reixaldia (Torres Novas, Santarém)** was excavated by Farinha dos Santos in

the 1980s. Abundant archaeological materials recovered indicate prolonged human occupation from the Neolithic to the Roman era (Andrade *et al.* 2010: 242). Funerary use during Late Prehistory is well documented with abundance of human remains, Late Neolithic and Chalcolithic pottery, beads, arrowheads, engraved schist plaques, etc. (Andrade *et al.* 2010: 242-243). Among other beads, we analyzed a translucent-pink cylindrical bead and a natural cylinder of translucent calcite in Museu Municipal Leonel Trindade de Torres Novas.

**Cabeço da Ministra Alta and Calatras IV (Alcobaça, Leiria)** natural caves were excavated during the late 19<sup>th</sup> century by Manuel Vieira Natividade (1903). Ministra Alta was in use from the Early Neolithic to Roman times. Despite later evidences of reuse during the Bronze and Iron Ages (Gonçalves 1978: 12-13; Silva 1998: 52), the assemblage recovered includes engraved schist plaques, decorated bone hairpins, flint and quartz geometrics and arrowheads, flint halberds, etc. (Natividade 1903; Gonçalves 1978; Silva 1998: 51-53) that points to a Late Neolithic/Early Chalcolithic funerary occupation of the cave. 23 beads worked out of greenstone and lignite were recorded together with the two translucent green beads studied here originally published as ribeirite<sup>2</sup> (Natividade 1903: 443; est. XVI) and the two perforated natural cylinders of calcite. From Calatras IV cave, apart from the abundant Late Prehistory items, Natividade (1903: 448; est. XVI) reported a *placa de espato calcáreo* that we have identified as a perforated translucent discoidal bead made of calcite.

**El Pozuelo megalithic necropolis (Zalamea la Real, Huelva)** is formed by 16 monuments of different typologies, distributed in two main groups, Los Llanetes and El Riscal-La Veguilla. Between 1945 and 1947, Pozuelo 1 to 9 were excavated by Carlos Cerdán (Cerdán *et al.* 1952), to whose excavations the beads studied here belong. Pozuelo 1 in Los Llanetes and Pozuelo 5 and 7 in El Riscal-La Veguilla visually dominate their relative groups. The monuments underwent complex transformations in their architecture and ritual spaces from the Late Neolithic to Late Chalcolithic (Linares 2011, 2016). A total of three quartz beads were recorded, one in the right chamber of Pozuelo 1, one in Pozuelo 5 and one in the left chamber of Pozuelo 7 (Cerdán *et al.* 1952). After the Leisners' work, Cabrero<sup>3</sup> reclassifies these beads as made of 'rock crystal'.

**Los Gabrieles 6 (Valverde del Camino, Huelva)** was the first of the 7 megalithic tombs that constitute

Los Gabrieles necropolis (Linares 2011, 2016) to be excavated in 1974 (Blanco and Rothenberg 1981). It is a dolmen with a polygonal chamber and a corridor. Although violated, a large assemblage of grave goods were recovered from this monument (a decorated-plaque idol, polished axes, flint and quartz arrowheads, and globular and hemispheric pottery). A total of 41 pendants and beads were recovered during the excavation, including a big barrel-type bead identified as fluorite by visual inspection (Blanco and Rothenberg 1981: 287; fig. 296: 4).

**Cueva del Vaquero (Alcalá de Guadaíra, Sevilla)** is double-chambered *tholos*, located in the megalithic necropolis of 'El Gandul' that was excavated by George Bonsor in 1902 (Leisner and Leisner 1943: 197-203). Despite the limited number of finds, the materials recovered were representative of the 3<sup>rd</sup> millennium BC: flint arrowheads with concave base, almond rim plates, hemispheric bowls and bell beakers together with a *Patella* were recovered. Additionally, a green quartz fragment was published as belonging to this *tholos* (Leisner and Leisner 1943: 203, *tafel* 60 and 66).

**'La Emisora' sector (Valencina de la Concepción, Sevilla)** is located in the farm "La Candelera" at the Chalcolithic site of Valencina de la Concepción/Castilleja de Guzmán (see García 2013 for a review). Numerous structures were documented in this sector in 1988 and 1989 (Murillo 1991: 559). According to the "abundant material and also burials" described by the excavators (Murillo 1991: 558), the *a priori* "hut floor" in the Emisora Norte sector (Murillo 1991: 557, fig. 1) was probably a funerary hypogeum. Among the unpublished remains from the Emisora Norte sector, we have identified a prismatic fluorite fragment; to date the only object in this raw material found at the site.

**Cueva de los Mármoles (Priego de Córdoba, Córdoba)** was in use from the Upper Paleolithic to Late Neolithic (Asquerino 1990; Carmona *et al.* 1999). Archaeological excavations (1982-1987) recorded a main occupational phase dated to the Early and Middle Neolithic (Asquerino 1990; Martínez 2010). The recovered materials include *almagra* and decorated pottery, lithic assemblages, bone tools, beads and pendants and all the stages of the stone bracelets *chaîne opératoire* (Martínez 2010). A translucent yellow pendant was recovered in the Middle Neolithic levels.

**Los Millares necropolis (Santa Fé de Mondújar, Almería)**. The excavations carried out by Luis Siret and Pedro Flores in this megalithic necropolis went practically unreported until the Leisners' publications. The site was later re-studied and re-excavated by Almagro and Arribas. Among the grave goods in Tholos 12, 37-V (Almagro and Arribas 1963: 124) and 63-III

<sup>2</sup> A variety of Zircon [Zr(SiO<sub>4</sub>)] named after J.C. Ribeiro.

<sup>3</sup> R. Cabrero García, "El fenómeno megalítico en Andalucía occidental". Tesis Doctoral inédita, Universidad de Sevilla, 1983, pp. 91, 107 and 135.

(Leisner and Leisner 1943: 52, *tafel* 24; Almagro and Arribas 1963: 116) four translucent “quartz” and “rock crystal” beads were documented. Among the 3,294 beads in Tomb 12, both Siret and the Leisners documented five purple beads in “amethyst quartz” (Leisner and Leisner 1943: 25, *tafel* 11). For different reasons we were only able to analyze the translucent beads in Tomb 12.

**Fuente Álamo tomb 111 (Cuevas de Almanzora, Almería)** was excavated on the southern side of the site in 1999 (see Schubart *et al.* 2000; 2006 for a review of the site). This unusual burial was formed by a quite large pit (2.20 x 1.50 m) that contained a large funerary urn (*pithos*) under a small mound of large stones. This contained the remains of a female 16-18 years of age, buried in a flexed supine decubitus position, with red pigment made from hematite and cinnabar around her skull (Schubart *et al.* 2006: 107). Both the tomb and the rich grave goods indicated her high social position. The grave goods were formed by three pottery recipients, particularly a small carinated vessel with remains of *Papaver somniferum* and fatty acids (Schubart *et al.* 2006: 107); a copper dagger, a large group of copper and silver bracelets and rings, as well as a series of silver and copper earrings and beads and nearly fifty beads in other raw materials, mostly minerals (Schubart *et al.* 2006: 106). Some of these beads were analyzed by XRD, and one in fluorite and another in quartz were identified, among other mineralogies (Pozo *et al.* 2002: 136, 140); this fluorite bead, together with the other samples analyzed in this study would have been pulverized as described by Pozo *et al.* (2002: 133). Another transparent bead among the adornments in Almería Museum (Schubart *et al.* 2006: 105, fig. 2-e) has been studied here.

**Anta Grande do Zambujeiro (Nossa Senhora da Tourega, Évora)** is a monumental megalith with a long corridor (8.8 m x 2.8 m), and a seven-orthostat polygonal chamber (5.7 m x 5.5 m) with slab roofing. At the end of the corridor, just before the chamber, a pillar supports the roofing (Soares and Silva 2010: 97-99). The entrance to the monument was preceded by an atrium and an enormous granite stele / standing stone. The mound possesses a perimeter ring c. 50 m in diameter and 9 m high. The first excavation was performed in Anta Grande do Zambujeiro by Henrique Leonor Pina in 1964-1968 but unfortunately it remains unpublished and no contextual information is available for the finds. Further excavations have recently been made in the tumulus (Santos 2009: 74; Soares and Silva 2010). Inside the chamber, the presence of microliths, variscite beads (Odrizola *et al.* 2012) and polished stone tools seems to date the first burials in the late 4<sup>th</sup> millennium BC (Santos 2009: 62). These older levels were sealed by a fallen chamber slab over-

lain by a long 3<sup>rd</sup> millennium BC occupational sequence. The most significant burial goods on top of this fallen slab are small decorated pottery vessels (Santos and Rocha 2015), arrowheads, engraved schist plaques, a gold foil, amber beads, and the fluorite bead. Chronologically, a radiocarbon date obtained from charcoal recovered in the tumulus excavations has given a calibrated date for the megalith that roughly spans the second half of the 3<sup>rd</sup> millennium BC (Soares and Silva 2010: 101). However, no further information about the beads’ archaeological context or stratigraphic associations are known other than the data given above.

**Cau de l’Olivar d’en Margall (Torroella del Montgrí, Girona)** cave discovered and excavated in 1925 by Luis Pericot who relates that the place was known by local farmers, prior to its discovery, as the place where several prehistoric “rosaries” (beads assemblages) had appeared. All the recovered materials lack stratigraphic and contextual information, because the cave’s deposit was stirred to remove the land for the neighboring olive grove. Archaeological excavations by Pericot (1939) recovered the following materials: a small assemblage of very fragmented human bones, a small axe, a flint retouched knife, three arrowheads, a copper rod of quadrangular section, and 444 beads, 8 of the beads were inventoried as *callaite*, 3 as calcite (globular beads), 23 (including a small piriformis pendant) as bone, 400 as steatite (standardized small black disc). Additionally, 5 dentalium beads and 3 fragments of beads were inventoried. Chronologically, the cave is ascribed by the author to the Eneolithic (Late Neolithic – Copper Age). Lately, another bead and some objects were recovered and reviewed (Pericot 1947). Pericot’s findings are deposited in the Museu d’Arqueologia de Catalunya (Barcelona).

#### **Other translucent materials described in the literature**

A relatively large number of sites have yielded translucent beads that we have been unable to analyze. Translucent pendants, considering also the cited ones at Cueva de los Mármoles and Cueva de la Pulsera, are referred in different natural caves in Andalusia, with occupations from the Ancient to Late Neolithic (6<sup>th</sup>-4<sup>th</sup> millennia BC). At La Araña’s rockshelter 6 (Málaga), calcite and gypsum pendants are referred from Layer 7 (Ancient Neolithic) (Ramos 2004). Calcite pendants are also described in Cueva del Toro’s (Antequera, Málaga) Layer IIIb (Goñi *et al.* 2004: 206), in Cueva del Agua de Pradonegro (Iznalloz, Granada) and in Las Majólicas (Alfacar, Granada) (Navarrete 1976).

Translucent beads have been documented at 3<sup>rd</sup> millennium BC megalithic sites, in south-east Iberia. García and Spahn (1959) refer in their studies of the megalith-

ic necropolis of Gorafe (Granada) to two spheroidal beads in Dolmen 49 in the La Sabina group and two bi-conical beads in Dolmen 84 in the Las Majadillas group. In both cases they are described as “quartz (false topaz)” (García and Spahni 1959: 59 and 64; lám. X: 14-16). Similarly, in Tomb 63-III at Los Millares (Santa Fé de Mondújar, Almería), four bi-troncoconical quartz beads were found (Leisner and Leisner 1943: 52, *tafel* XXIV: 12-14) and decades later two “biconical rock crystal” beads were picked up on the surface level of the tomb (Almagro and Arribas 1963: 116). Tomb 37-V at Los Millares yielded among the grave goods a “biconical quartz bead” (Almagro and Arribas 1963: 124). Finally, at Valencia de Alcántara (Cáceres) megalithic necropolis there is a reference to a “rock crystal” bead at the dolmen of Las Lanchas I, and a “white quartz” bead at Datas II dolmen (Bueno 1988: 52, 146). In the second millennium BC, references have been made to transparent and translucent beads at several funerary sites in the context of El Argar. Beads of “transparent white stone” were described in Tombs 55, 292, 454 and 636 at El Argar and in Tomb 6 at Gatas (Siret and Siret 1890). A spherical bead made of “milky quartz” was described in Burial 1 at the Bronze Age site of Lomas del Alcázar de Úbeda (Jaén) (Ruiz *et al.* 1998: 304).

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