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Early Neolithic Settlement and Graves in Lisbon's Historic Centre

Povoamento e sepulturas do Neolítico Antigo no Centro Histórico de Lisboa

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Abstract

In recent years, information regarding the human presence during the Early Neolithic period in the Historic Center of Lisbon has increased, as a result of numerous preventive archaeological excavations carried out within the scope of mitigating impacts resulting from the recovery of old buildings or the construction of new ones. Such work, carried out by several Archeology companies that have worked in areas considered to be of greatest archaeological sensitivity within the city of Lisbon, have led to results of exceptional relevance for the knowledge of the first producing societies that occupied this territory from the last quarter of the 6th millennium BC. Thus, not only large settlements were identified, such as Encosta de Sant'Ana and Bairro Alto, integrating several loci, such as Palácio Ludovice. The first structured graves known in Portuguese territory at this time were also identified, in close association with the inhabited spaces, corresponding to individual depositions in the fetal position carried out at the bottom of small graves excavated in the geological substrate. The importance of these discoveries justified the presentation of this synthesis, which summarizes all the information published to date.

Key words: Early Neolithic, Historic Center of Lisbon, settlement, graves

Resumo

Nos últimos anos, multiplicaram-se as informações relativas à presença humana no decurso do Neolítico Antigo no Centro Histórico de Lisboa, em resultado das numerosas escavações arqueológicas preventivas realizadas no âmbito da mitigação de impactos decorrentes da recuperação de edifícios antigos ou da construção de novos imóveis. Tais trabalhos, executados por diversas empresas de Arqueologia que têm trabalhado nas áreas consideradas de maior sensibilidade arqueológica dentro da cidade de Lisboa, têm conduzido a resultados de excepcional relevância para o conhecimento das primeiras sociedades produtoras que ocuparam este território a partir do ultimo quartel do 6.º milénio BC. Assim, identificaram-se não só povoados de grande extensão, como o da Encosta de Sant´Ana e o do Bairro Alto, integrando diversos *loci*, como o do Palácio Ludovice. Foram também identificadas, em estreita associação com os espaços habitados, as primeiras sepulturas estruturadas conhecidas no território português desta época, correspondentes a deposições individuais em posição fetal realizadas no fundo de pequenos covachos escavados no substrato geológico. A importância destas descobertas justificou a apresentação desta síntese, que resume toda a informação até ao presente publicada.

Palavras-chave: Neolítico Antigo, Centro Histórico de Lisboa, povoamento, sepulturas

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1. Introduction

Recent preventive interventions conducted in Lisbon's historic center disclosed new archaeological sites that have provided relevant contexts from the Early Neolithic period. Domestic contexts have been identified, sometimes alongside funerary contexts, featuring different types of site location strategies. These are therefore extremely significant sites for studying the residential and funerary components of the earliest Neolithic societies in the western Iberian Peninsula (figure 1).

The summarized characterization of each site presented herein resulted in an attempt at reconstructing the occupation strategy of the territory corresponding to the older part of the present-day city of Lisbon. Its absolute chronology was defined by means of new AMS radiocarbon dates obtained on human and faunal remains.

2. The archaeological sites

2.1. Alfama riverine area - the former Armazéns Sommer

The archaeological works conducted between 2004 and 2016 by the Neoépica Lda. archaeology company, as part of the project to build a hotel, focused on a block stretching along the right bank of the Tagus River, at the base of the hill where the old quarter of Alfama still stands (figure 1). These archaeological interventions revealed a long and continuous occupational sequence (Ribeiro et al., 2017).

In terms of the funerary record, we would highlight the Early Neolithic pit burial (Rebelo et al., 2017). This is a negative structure, corresponding to a burial pit excavated in sterile, orangery sandy sediments, identified in an area adjacent to the foundations of the former palace of the Condes de Coculim counts.

The presence of this negative structure was initially revealed by a brownish patch, darker than the surrounding sediments, which yielded some flint items and mammal fauna. Some fragments corresponding to a vessel made from a very friable fabric were found at the northern edge of the pit, along with several stone blocks (figure 2).

The recovered vessel featured a narrow neck and wide body, paraboloid in shape, with two horizontally perforated handles, fully decorated using the Boquique technique, and was buried deep in the pit, leaning against its northern wall (Cardoso et al., 2018, fig. 5, 6 and 7) (figure 3).

The negative structure had a shallow depth of around 10 cm and was ellipsoidal in shape, since its middle and upper part had been removed by ablation during the historic occupations of the site. The apparently flattened bottom of the pit contained the inhumation burial of an individual in anatomical connection, buried in right lateral decubitus, with flexed limbs and in a NW-SE orientation (figure 4). The head was probably facing northwest. It was not possible to determine the individual's gender and no osteological alterations were observed. The age at death was probably older than seventeen. Overall, the assemblage was in good condition, although fragmented; the skull was missing due to the cutting of the pit, on the western side, due to the construction of the palace's foundations in modern times.

The chronology of the burial corresponds to the transition from the sixth to the fifth millennium BC, thus corresponding to the Evolved Early Neolithic, according to radiocarbon analysis results obtained on a long bone fragment, and is consistent with the typology of the associated ceramic vessel (Cardoso et al., 2018) (figure 5).

The sediments that filled what was left of the burial pit, deposited above the level where the skeleton laid, yielded several lithic artefacts and some mammal fauna, along with several stone blocks (figure 6). These remains were thought to originate from the adjacent inhabited area, although the latter was not identified during the excavation (Cardoso et al., 2018).

The assemblage of lithic artefacts, all made on whitish-grey flint, may be of local origin, as this raw material could easily be obtained from the Upper Cenomanian limestones that outcropped further downstream, bordering the riverside on the right bank of the Tagus, between the former beach of Santos and Alcântara, former Alcântara stream.

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Figure 1. Location of the sites referred to in the text, in the area of the Esteiro da Baixa inlet. A. Location on the Iberian Peninsula. B. Location on Lisbon's current urban layout. C. Location of the Neolithic occupation on Lisbon's isometric plan (current contour lines). 1. Former Armazéns Sommer. 2. Palácio dos Lumiares / Palácio Ludovice. 3. Encosta de Sant'Ana

Figura 1. Localização dos sítios mencionados no texto, sobre a área do Esteiro da Baixa. A. Localização na Península ibérica. B. Implantação na malha urbana actual de Lisboa. C. Localização da ocupação neolítica na planta isométrica de Lisboa (curvas de nível atuais). 1. Antigos Armazéns Sommer. 2. Palácio dos Lumiares / Palácio Ludovice. 3. Encosta de Sant'Ana

This small assemblage includes a core for flakes, whose matt sheen suggests thermal flaking, a fragment of a core and only two tools: a blade with thermal flaking, retouched on both lateral edges, and an incomplete retouched point (figure 6) (Cardoso et al., 2018, fig. 8). The significant predominance of chippage and knapping debris is a clear indication of a residential occupation located close to the site where flint was knapped using raw material easily obtained from the aforementioned coastal stretch located downstream.

Along with the lithic materials, a small but very heterogeneous and diverse assemblage of faunal remains was also recovered, consisting exclusively of

Figure 2. Pit burial unearthed at the former Armazéns Sommer. Overall view of the pit showing a layer deposited atop the level of the burial, containing heterometric limestone blocks. The top of the vessel can be seen at the edge of the pit, revealing its black-coloured fabric. Photo by Neoépica, Lda. (in Cardoso et al., 2018: fig. 3, above)

Figura 2. Enterramento em fossa identificado nos Antigos Armazéns Sommer. Aspecto geral da fossa observando-se camada depositada sobre o nível da inumação, embalando blocos calcários heterométricos. O topo do vaso pode ver-se no limite da fossa, evidenciando-se a pasta de coloração negra. Foto Neoépica, Lda. (em Cardoso *et alii*, 2018: fig. 3, superior)

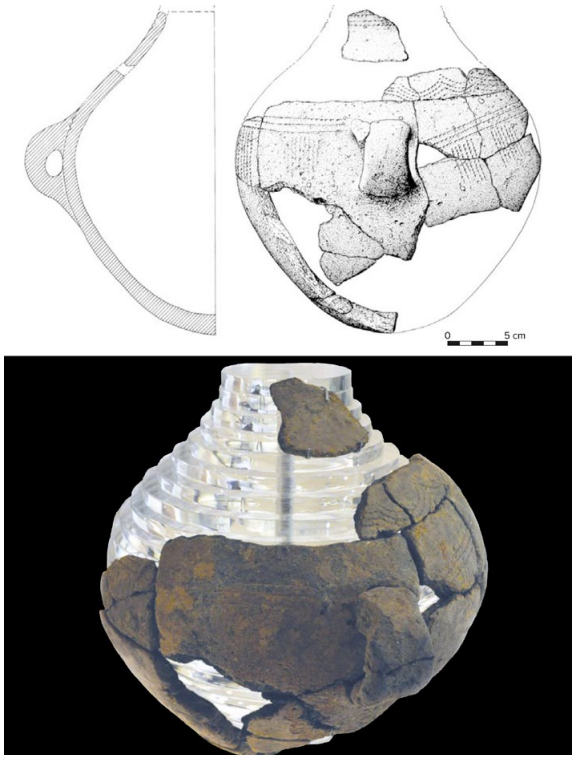

Figure 3. Three-dimensional reconstitution of the vessel recovered from the burial pit from the Lisbon riverside area, former Armazéns Sommer (drawing by F. Martins; Photo by G. Cardoso)

Figura 3. Reconstituição tridimensional do vaso recuperado no enterramento em fossa na zona ribeirinha de Lisboa, Antigos Armazéns Sommer (desenho de F. Martins; Foto G. Cardoso)

domestic species (domestic ox, sheep and/or goat and domestic pig), which indicates a remarkable stage of sedentation. Its characteristics are consistent with the remains of domestic consumption and not with any ritual offering of meat that might have been deposited inside the pit.

We would therefore hypothesise that these remains could have been embedded in sediment originating from the nearby settlement, deposited inside the pit at a higher level than the burial mound. However, the total absence of malacological remains stands out, in clear contrast to the diet of this population, based on the results of the isotopic analysis carried out on the human bones, as would be expected given the location of the archaeological site (Cardoso et al., 2018).

2.2. Bairro Alto

This is a vast residential site with a funerary component, located at the southeastern end of an elongated interfluve, on the top of a steep slope with good visibility over the Tagus and associated with small water lines that flowed close by (Valera, 2006).

This is a quite large area where several buildings from the modern and contemporary periods have been partially renovated, requiring preliminary archaeological works conducted by several archaeology teams as part of the urban rehabilitation of this area, the Bairro Alto quarter (figure 1).

Residential contexts

The Palácio dos Lumiares palace

The excavation of the site followed several preventive interventions carried out as part of a rehabilitation project and conducted by ERA-Arqueologia S.A. company (2002, 2003, 2007, 2009, 2010). A preliminary study of the contexts unearthed during the 2002 and 2003 field seasons refers to the identified Neolithic substrata (a blackened paleosol) and the recovered assemblages, characterised by the abundance of flint lithic industries compared to the presence of ceramics or polished/wrought stone finds (Valera, 2006). These industries feature

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Figure 4. Burial pit unearthed at the former Armazéns Sommer. Overall view of the pit, showing the cut in the ground that sectioned the western side of the pit. Several long bones can be seen in anatomical connection: from left to right, in the foreground, left femur; right femur; left cubitus; left radius; right humerus; left humerus and ribs. The vessel lies above the ribs, fragmented in situ. Photo by Neoépica, Lda. (in Cardoso et al., 2018: fig. 3, below)

Figura 4. Enterramento em fossa identificado nos Antigos Armazéns Sommer. Aspecto geral da fossa, evidenciando-se o corte no terreno que a seccionou do lado ocidental. Observam-se diversos ossos longos em conexão anatómica: da esquerda para a direita, em primeiro plano, fémur esquerdo; fémur direito; cubito esquerdo; rádio esquerdo; húmero direito; húmero esquerdo e costelas do lado esquerdo. Acima das costelas, jaz o vaso, fragmentado *in situ*. Foto Neoépica, Lda. (em Cardoso *et alii*, 2018: fig. 3, em baixo)

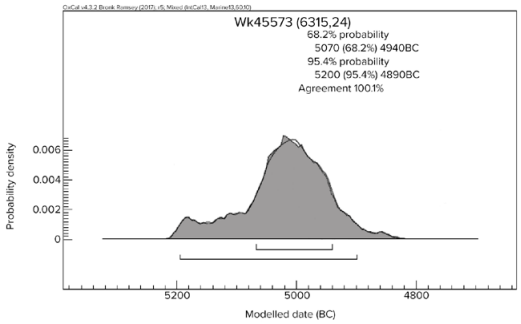


Figure 5. Radiocarbon dating results obtained at the University of Waikato laboratory (New Zealand)

Figura 5. Resultados de datação por radiocarbono obtidos no Laboratório da Universidade de Waikato (Nova Zelândia)

a microlaminar trend, aimed at the production of bladelet tools, including geometric, segment-like armatures (Ferreira, 2016). The local knapping activities are attested to by the recovery of numerous flakes and chippage, as well as "whole and knapped flint nodules, fragments of slabs (tabular flint), decortication flakes, numerous cores from which flakes and bladelets were extracted, as well as core-rejuvenation products (*tablettes*)" (Valera, 2006: 98). Flint could have originated from the prehistoric mines of Campolide, less than 2.5 kilometres away.

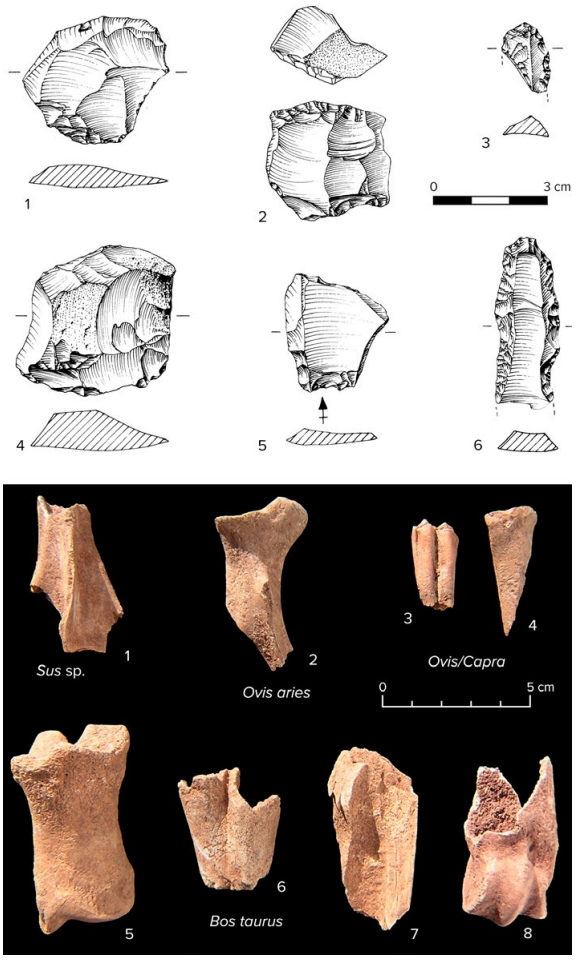
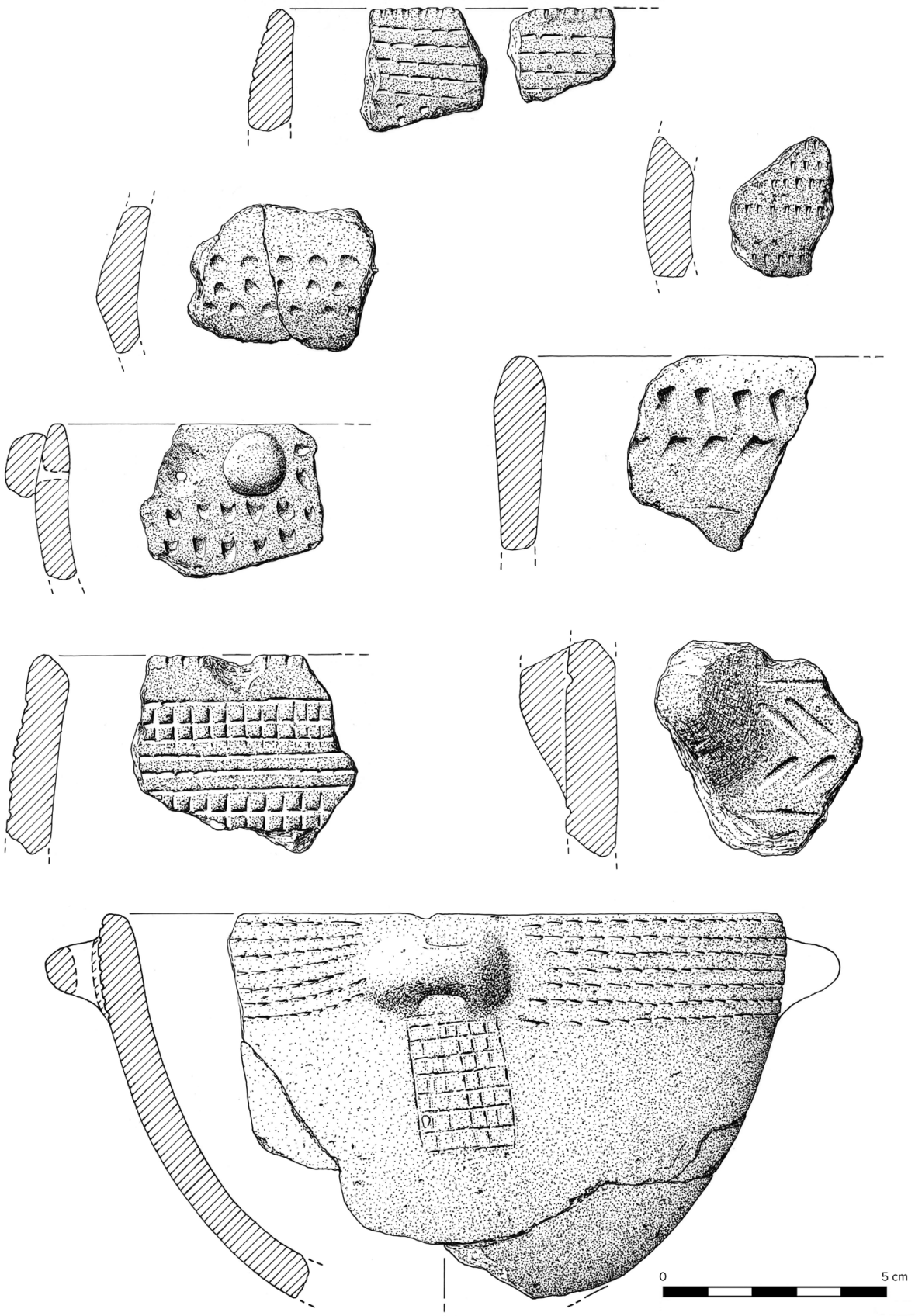


Figure 6. Flint assemblage and faunal remains recovered from the residual deposit filling the pit, above the burial unearthed at the former Armazéns Sommer (drawings by F. Martins; Photo by J. L. Cardoso)

Figura 6. Espólios de sílex e conjunto faunístico recolhidos no depósito residual do enchimento da fossa identificado nos Antigos Armazéns Sommer, acima da inumação (desenhos de F. Martins; Foto J. L. Cardoso)

The ceramic assemblage recovered consisted of fragments of closed vessels and cups/bowls with plain or decorated surfaces, combining impressed and incised motifs, including the Boquique technique and chevron-like decoration ('false acacia leaf'), grooves under the rim and plastic elements such as handles with vertical perforations. Remains of mammal, malacological and ichthyological fauna were also recovered (Valera, 2006).

Some in situ structures were detected in the different test pits excavated in the courtyard and inside the building, e.g. a hearth and some post holes dug into the archaeologically sterile palaeosol (Valera, 2014).



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Travessa da Boa Hora

The preventive archaeological works carried out at this site were conducted by the ERA-Arqueologia, S.A. company in 2007, as part of the impact mitigation required by the digging of a trench to replace water supply pipes.

The stratigraphy of the identified prehistoric deposits is generally comparable to the one described for the previous site. The excavation revealed the extent of the colluvial deposit, extending along a former gentle slope, which was observed over a stretch of some twelve metres (Valera, Coelho and Ferreira, 2008).

The assemblage of knapped stone materials accounted for most of the artefacts recovered. The ceramics, both plain and decorated, were very fragmented.

Palácio Ludovice palace

The full excavation of the subsoil at the location of this eighteenth-century palace was conducted between 2018 and 2019 by the Neoépica, Lda. company team. Several residential structures were uncovered — a stone-paved area, *en cuvette* hearth features and clay structures — as well as funerary structures, revealing a mixed occupation that can be ascribed to the Evolved Early Neolithic period (Simões et al., 2020).

The ceramics unearthed from this residential context are mostly plain; among the decorated items, there are indented-lip rims (figure 7, nos. 1 and 6), incised patterns in horizontal squared bands (figure 7, no. 8), alternating with simple lines impressed using the Boquique technique (figure 7, nos. 6 and 8), corresponding to composite patterns combining two different decorative techniques.

The knapped stone assemblages include cores (figure 8, no. 1), segments (crescents), some of which are really small (figure 8, nos. 2 to 5), bladelets and blades, generally unretouched or with discontinuous, marginal retouch (figure 8, nos. 6 to 10), retouched flakes and notches on blade, as well as borers with abrupt retouch, resulting in very slender perforating tips (figure 8, nos. 11, 12, 14 and 15).

The scarce polished stone utensils are characterised by small hoes made from local stone, according to the asymmetry observed in the longitudinal profile of the cutting edge (figure 8, no. 16), as well as possible axes, larger and more robust, with a subcircular cross-section (figure 8, no. 17).

To sum up, although the sites that revealed Early Neolithic occupations were excavated by different archaeology companies in different years, the proximity of the sites, the homogeneity of the recovered material culture and, above all, the fact that all this evidence is stratigraphically related to the same colluvial deposit, indicate that they may have been part of a single, extensive settlement.

The funerary context was found at the Palácio Ludovice site by the Neoépica Lda. company team, in sector C10, a few centimetres from the foundations of the nineteenth century building, and consists of a pit dug into layer A (clay and fine orange sand, very compact and homogeneous, devoid of archaeological remains). The skeleton was in lateral decubitus, with legs and arms flexed (foetal position) (figure 9). Large ceramic fragments belonging to the same vessel, of considerable size, were recovered in a space vertically coinciding with the burial. All the fragments of this vessel were found at the bottom of the burial pit; the sediment surrounding it was characterised by the significant abundance of oxidised cracks. In this context, the fragments of the neck were at higher elevations than the fragments of the body, some of which were in vertical position. This

← **Figure 7.** Archaeological materials recovered from the Palácio Ludovice. 1. Fragment of a vessel with indented rim and Boquique horizontal line decoration. 2 to 5. Fragments of vessels with stamped decorations. 6. Fragment of a vessel with indented rim and mixed technique decoration: incised squares and horizontal lines with Boquique technique. 7. Fragment of a vessel with a prehensile element on the rim and decorated with dragged incisions made with a blunt tip, similar to "false acacia leaf". 8. Calotte-shaped bowl with a vertically perforated ring handle and mixed decoration: Boquique lines under the rim and incised lines forming a reticulate motif under the handle (drawings by F. Martins)

Figura 7. Materiais arqueológicos recolhidos no Palácio Ludovice. 1. Fragmento de vaso com bordo denteado e decoração de linhas horizontais a «boquique». 2 a 5. Fragmentos de vasos com decorações impressas a matriz. 6. Fragmento de recipiente com bordo denteado e decoração de técnica mista: quadriculado inciso e linhas horizontais com técnica «boquique». 7. Fragmento de recipiente com elemento de preensão sobre o bordo e decorado por incisões arrastadas feitas a ponta romba, semelhantes a «falsa folha de acácia». 8. Taça em calote com asa anelar perfurada verticalmente e decoração mista: linhas a «boquique» sob o bordo e reticulado produzido por linhas incisas sob asa (desenhos de F. Martins)

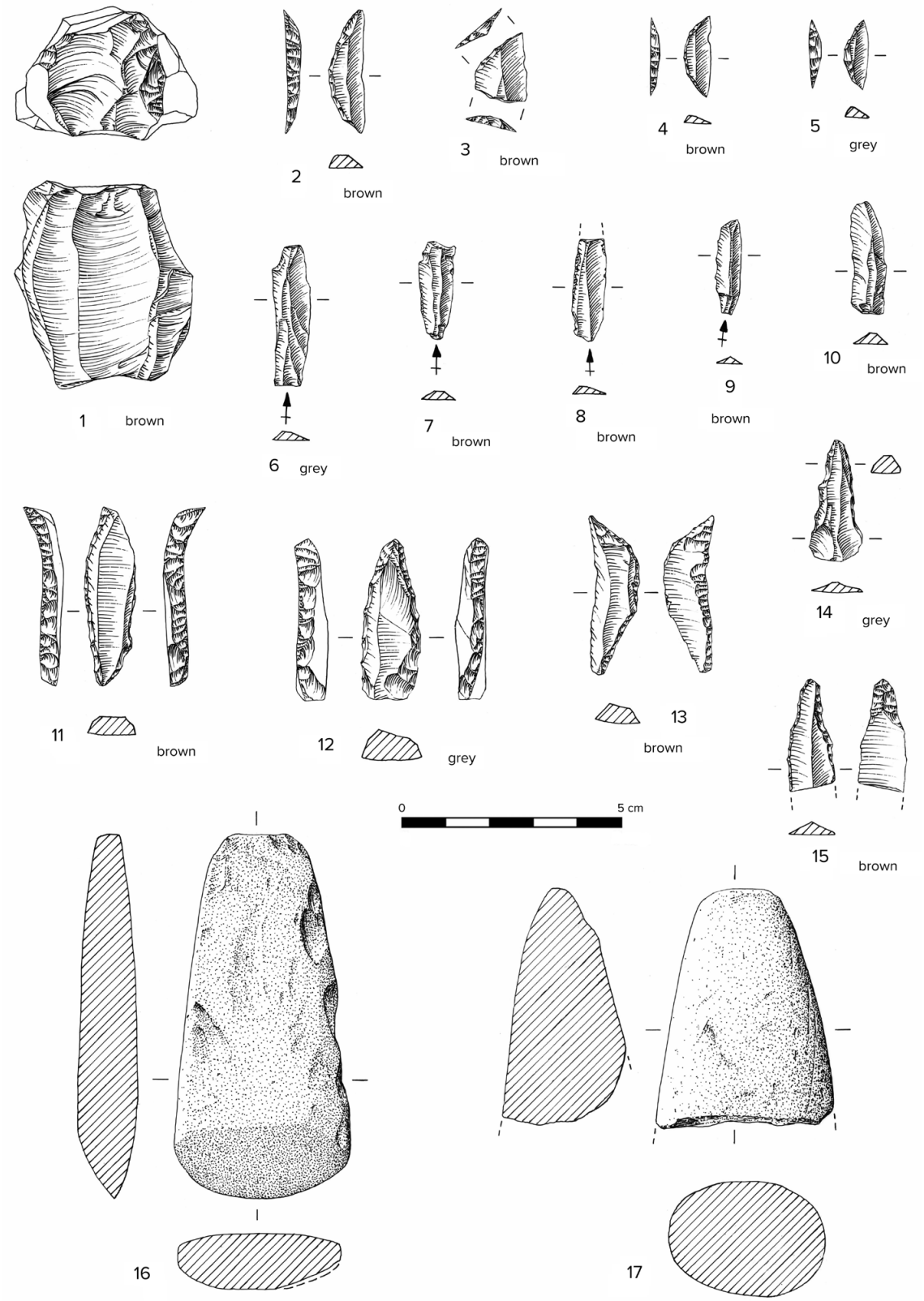

Figure 8. Archaeological materials recovered from Palácio Ludovice. 1. Core. 3 to 5. Lithic geometrics. 6 to 10. Bladelets. 11, 12, 14 and 15. Borers. 13. Large geometric. 16. Polished stone: hoe made from very fine siliceous sedimentary rock. 17. Fragment of a possible axe made from a similar rock (drawings by F. Martins)

Figura 8. Materiais arqueológicos recolhidos no Palácio Ludovice. 1. Núcleo. 3 a 5. Geométricos. 6 a 10. Lamelas. 11, 12, 14 e 15. Furadores. 13. Grande geométrico. 16. Pedra polida: enxó de rocha sedimentar siliciosa muito fina. 17. Fragmento de possível machado executado em rocha semelhante (desenhos de F. Martins)

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Figure 9. Palácio Ludovice. Funerary context from sector C10. A. View of an artificial basal level of layer C, with part of the fragments of the large vessel collapsed in situ; note the presence of cracks forming a polygonal pattern in plan. B. View of the excavation of the same context, already at the bottom of the burial pit. C. Skeleton of the buried individual. Below, 3D survey of the skeleton of the buried individual, showing its position in lateral decubitus with legs and arms flexed (foetal position). Photo by Neoépica, Lda. (in Simões et al., 2020: fig. 6)

Figura 9. Palácio Ludovice. Contexto funerário do sector C10. A. Aspecto de um nível artificial basal da camada C, com parte dos fragmentos do grande vaso colapsado *in situ*; note-se a presença de gretas conformando um padrão poligonal em plano. B. Aspecto da escavação do mesmo contexto, já no fundo da fossa funerária. C. Esqueleto do indivíduo inumado; em baixo, levantamento 3D do esqueleto do indivíduo inumado, evidenciando-se a sua posição em decúbito dorsal com pernas e braços retraídos (posição fetal). Photo by Neoépica, Lda. (em Simões *et alii*, 2020: fig. 6)

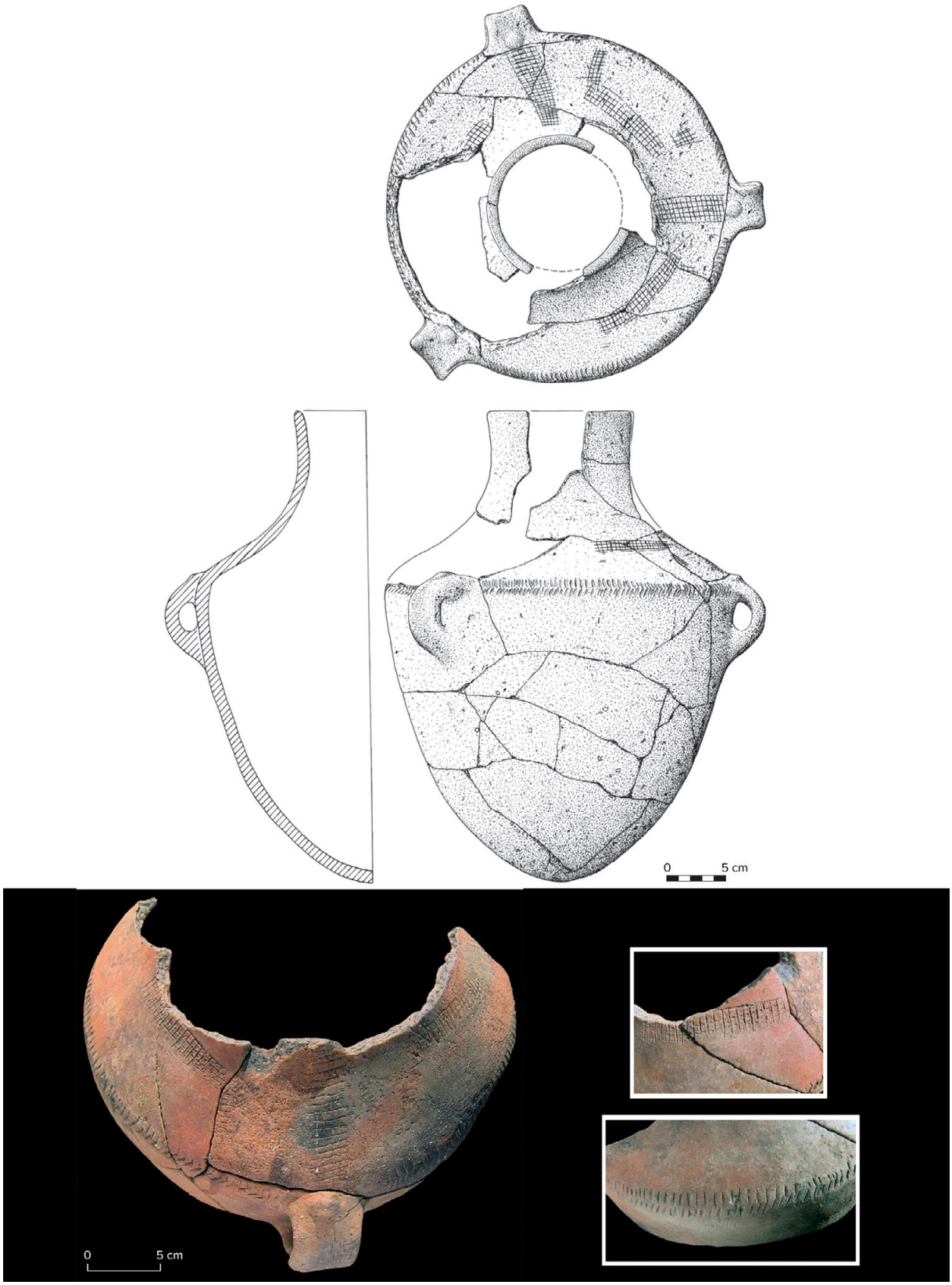

Figure 10. Palácio Ludovice. Vessel deposited over the burial pit, reconstituted from the recovered fragments, and decorative details (drawing by F. Martins; Photo by J. L. Cardoso)

Figura 10. Palácio Ludovice. Vaso depositado sobre a fossa funerária, reconstituído a partir dos fragmentos recuperados, e pormenores decorativos (desenho de F. Martins; Foto J. L. Cardoso)

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Figure 11. Overview of the archaeological intervention at Encosta de Sant'Ana (in Leitão, Cardoso and Martins, 2021: fig. 3)

Figura 11. Vista geral de intervenção na Encosta de Sant'Ana (em Leitão, Cardoso e Martins, 2021: fig. 3)

layout suggests that the vessel was placed vertically on the ground, and probably half-buried in it, also because it had a paraboloid base that prevented it from standing upright, and it collapsed in situ. This is therefore a vessel that was probably placed above the pit, as if to mark the location of the burial (figure 9). It has a cylindrical neck (figure 10), with the upper part of the body marked by a sharp inflection decorated all round by an impressed line that does not match the well-known "chevron" or "false acacia leaf" patterns, as the latter are impressed with a narrow, elongated stamp, applied perpendicularly or obliquely to the surface of the vessel and frequently misaligned. Three ribbon-like handles decorated at the top with a small lug start from the inflection that separates the upper and lower parts of the body and join the lower part of the body. The upper part of the body shows an incised decorative pattern made up of several squared areas incised around the neck, alternating with similar vertical areas that reach the upper part of the three handles. Small, isolated areas of the body also show the same decorative pattern, while the lower part of the vessel is entirely plain (Simões et al., 2020) (figure 10).

The primary Neolithic context, represented by the above-mentioned funerary structure, was located in the area adjacent to the residential context. This shows that both contexts — funerary and residential — coexisted side by side (Simões et al., 2020).

2.3. Encosta de Sant'Ana slope

Located at the foot of the east-facing slope of the Sant'Ana hill, this settlement extended as far as the right bank of the Arroios stream, near its confluence with the Baixa inlet, between the approximate elevations of 15.50 and 22 metres (figure 11).

Neolithic contexts were identified in sectors C and E during the first archaeological intervention, carried out in 2002 in the scope of preventive archaeology works (Muralha and Costa, 2006). In a second phase of the works, between 2004 and 2006,

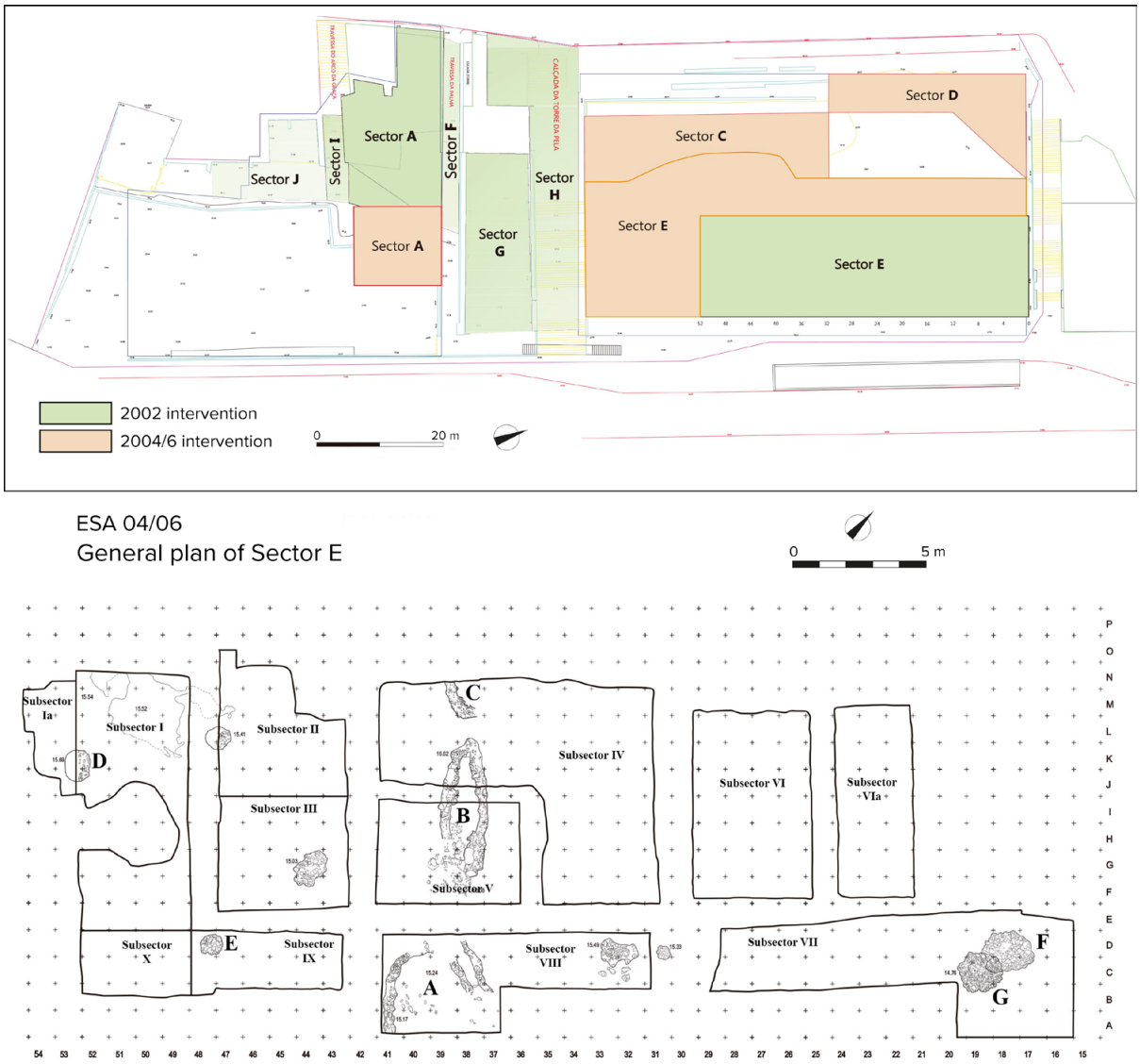

Figure 12. Encosta de Sant'Ana. Above: plan of the sectors explored during the two cycles of archaeological works (2002 and 2004-2006). Below: general plan of Sector E, from the 2004/2006 archaeological field season, showing the adopted grid and the location of the main archaeological structures recorded (in Leitão, Cardoso and Martins, 2021: fig. 4, 5)

Figura 12. Encosta de Sant'Ana. Em cima: planta dos sectores intervencionados nos dois ciclos de trabalhos arqueológicos (2002 e 2004-2006); Em baixo: planta geral do Sector E, da campanha arqueológica de 2004/2006, com a imposição da quadrícula adoptada e a implantação das principais estruturas arqueológicas identificadas (em Leitão, Cardoso e Martins, 2021: fig. 4, 5)

the methodology was adjusted to the extent of the plot to be explored, due to the significant expansion of the work area, deepening and widening the most promising zone, corresponding to Sector E (Leitão, Cardoso and Martins, 2021) (figure 12).

The Neolithic occupation level, corresponding to layer 5 of the stratigraphic sequence defined in Sector E, with an average thickness of 30-40 cm, was found right on top of a paleosol of alluvial origin, on which the residential structures were founded. Layer 5 yielded plain and decorated ceramics, lithics and faunal remains, corresponding to an intact and sealed deposit.

The archaeological intervention carried out in Sector E revealed several well-preserved dwelling structures corresponding to a hut with a subcircular floor plan (Structure A), an elongated and closed structure with an ellipsoidal outline, narrow and elongated, of undetermined use (Structure B), a curved structure (Structure C) and several stone-paved areas, showing evidence of their use as heating hearths (Structures D, E, F and G) (figure 12).

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As far as knapped lithic materials are concerned, the proximity of the raw material sources — Cretaceous (Upper Cenomanian) flint nodules and blocks — explains the abundance of both cores and debitage by-products; thus, flint was intensively knapped at this site.

The shaping of the cores and the debitage techniques, involving heath treatment, are aimed at the production of blade blanks, which are very well represented by the tools themselves. In fact, the practice of heat treating the raw material is well recorded through the recovery of 212 flint flakes in a small pit, associated with a large, stone-paved heating hearth (Structure F). Lithic refitting enabled the reconstitution of the size and shape of seven blocks gathered from the reef limestone benches existing in the western part of Lisbon, which used to line the Tagus shoreline between Alcântara and Santos beach (Leitão, Martins and Cardoso, 2023). Cutting tools are predominant, particularly retouched blades (125 items), followed by perforating tools (borers, 42 items), and geometric tools, represented by segments (25 items), trapezoids (3 items), triangles (2 items), and backed bladelets and blades (10 and 1 respectively). Overall, the knapped stone industry can be defined as featuring a microlaminar trend (Leitão, Cardoso and Martins, 2021) (figures 13 and 14). The polished stone materials are dominated by small axes made from fine-grained metasedimentary rocks of regional origin, probably from the contact metamorphism strip of the Sintra eruptive massif ("Ramalhão schists"), a conclusion confirmed by the axes made from basic filonian igneous rocks originating from the same region (figure 15, nos. 3 to 10). However, the presence of a fibrolite votive hoe means that long-distance transregional networks were already established at this time (figure 15, no. 2).

The only ornament found is a calcite pendant, rounded by means of polishing, with a "bitroncoconic" perforation at one end, comparable to a similar item, probably of the same chronology but of larger dimensions, found in cave II of Senhora da Luz, Rio Maior (figure 15, no. 1).

The bone industry is limited to a few awls and needles, which are therefore everyday items (figure 16).

The ceramic productions, both plain and decorated, are dominated by closed vessels less than 20 cm in diameter. However, there are some larger vessels, possibly storage containers, indicating a relatively stable occupation of the site, which is consistent with the hypothesis that it was occupied on a peri-annual basis.

The decorated ceramic fragments from Encosta de Sant'Ana show a remarkable variability of motifs, with the decorations obtained using the "boquique" impressed technique (40.8%) and the vessels decorated using a combined technique, associated with plastic elements (lugs, embossed cordons) and incised decoration, clearly standing out. There are also 'chevron' motifs, organised in horizontal bands below the rim of the vessels, and a high number of vessels with a plain indented lip (20%) (figure 17).

In terms of the food economy, the faunal remains recovered at Encosta de Sant'Ana (343 mammal remains recovered from layer 5) show a high degree of fragmentation, evidencing an exhaustive dietary use (Cardoso, Martins and Leitão, 2023) (table 1).

	NDR		MNI	
	No.	%	No.	%
Bos taurus	9	2.6%	1	3.1%
Bos cf. primigenius	1	0.3%	1	3.1%
Sus sp.	91	26.5%	5	15.6%
Ovis / Capra	36	10.5%	2	6.3%
Ovis aries	27	7.9%	2	6.3%
Cervus elaphus	15	4.4%	1	3.1%
C. familiaris	1	0.3%	1	3.1%
O. cuniculus	163	47.5%	19	59.4%
TOTAL	**343**	**100%**	**32**	**100%**

Table 1. Encosta de Sant'Ana. Number of Determined Remains (NDR) and Minimum Number of Individuals (MNI) (in Cardoso, Martins and Leitão, 2023: 28)

Tabela 1. Encosta de Sant'Ana. Número de Restos Determinados (NDR) e Número Mínimo de Indivíduos (MNI) (em Cardoso, Martins and Leitão, 2023: 28)

Some anatomical segments were cut down for stewing or boiling in some cases, while in others they were cooked directly over the fire, on grills or barbecues, as evidenced by the bone fragments showing marks of exposure to the fire, causing more or less localised blackening of the bone surfaces. Wild animals are represented, in decreasing order, by rabbit, followed by wild boar/domestic pig, deer and aurochs; domestic species probably include pigs, caprines (sheep and goats), domestic cattle and dogs.

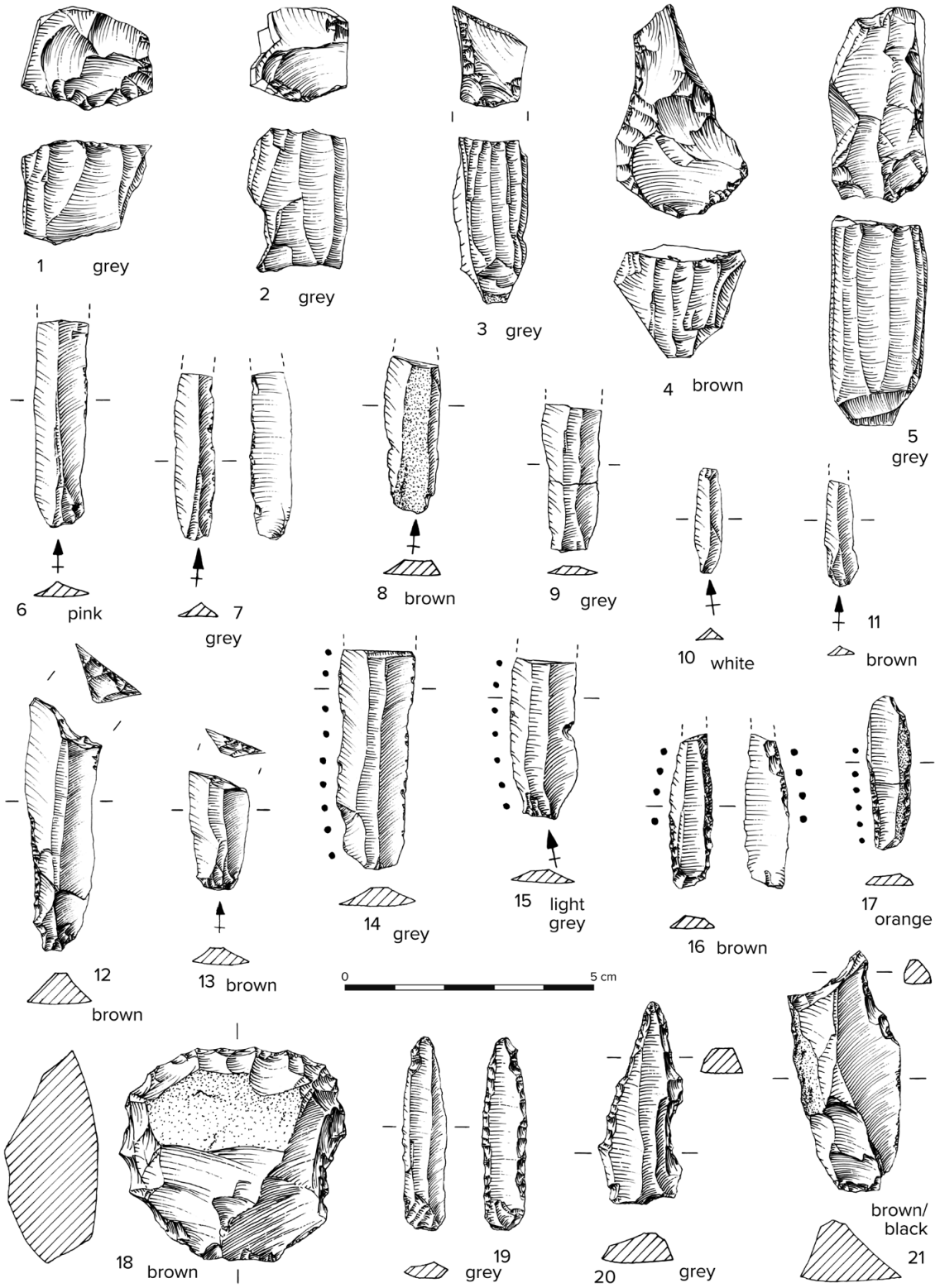

Figure 13. Archaeological materials recovered from Encosta de Sant'Ana. Knapped stone industry. 1 to 5. Cores. 6 and 7. Retouched bladelets. 8 to 11. Lamellar products. 12 and 13. Truncated blades. 14 and 15. Retouched blades with sickle sheen. 16 and 17. Retouched bladelets with sickle sheen. 18. Endscraper on flake. 19. Borer on bladelet. 20 and 21. Borers on blade (drawings by F. Martins)

Figura 13. Materiais arqueológicos recolhidos na Encosta de Sant'Ana. Indústria de pedra lascada. 1 a 5. Núcleos. 6 e 7. Lamelas com retoques. 8 a 11. Produtos lamelares. 12 e 13. Truncatura sobre lâmina. 14 e 15. Lâminas com retoque e lustre de cereal. 16 e 17. Lamelas com retoque e lustre de cereal. 18. Raspadeira sobre lasca. 19. Furador sobre lamela. 20 e 21. Furador sobre lâmina (desenhos de F. Martins)

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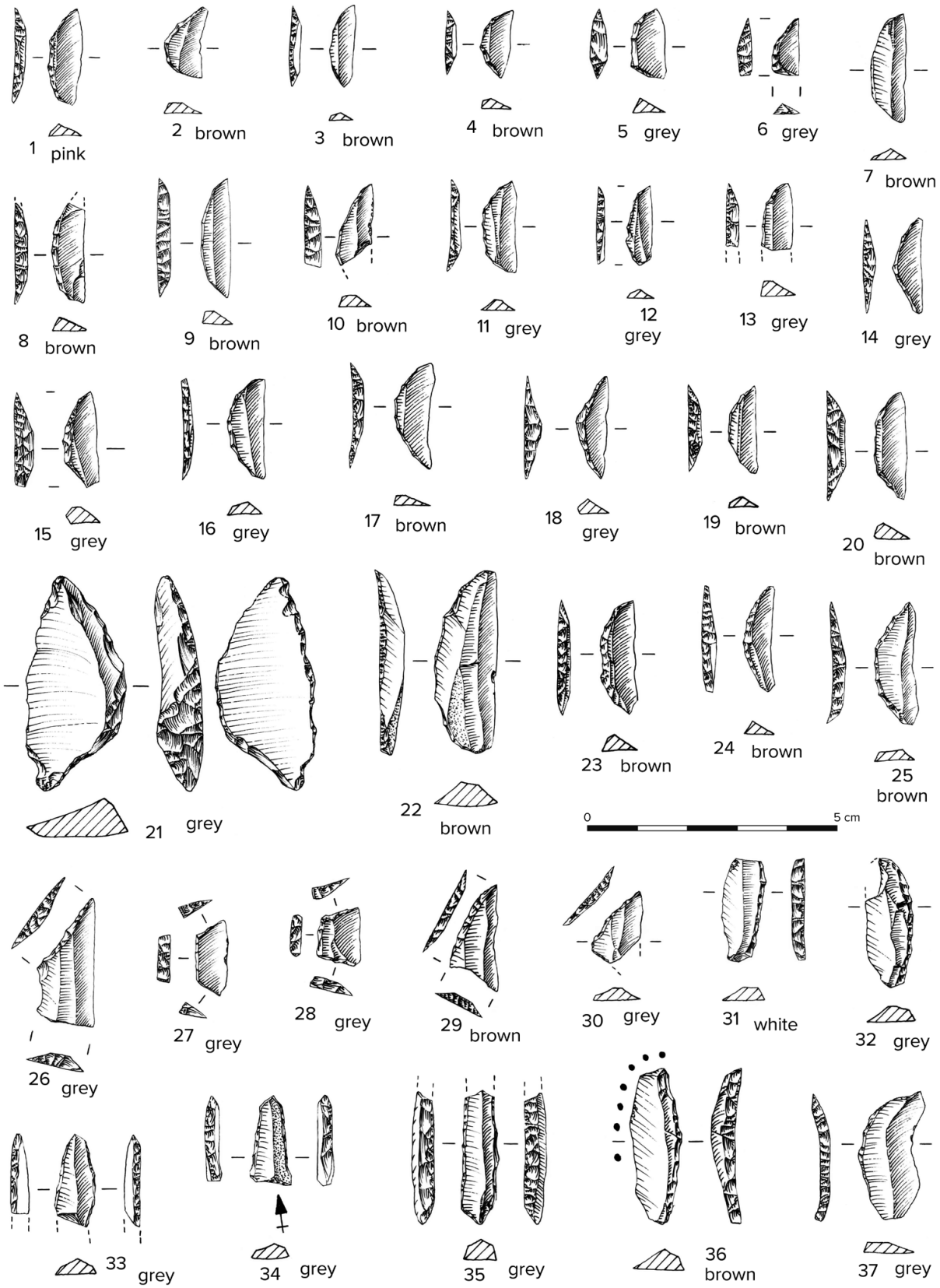

Figure 14. Archaeological materials recovered from Encosta de Sant'Ana. Knapped stone industry. 1 to 25. Segments. 26 to 28. Trapezoids. 29 and 30. Triangles. 31 to 37. Backed bladelets (drawings by F. Martins)

Figura 14. Materiais arqueológicos recolhidos na Encosta de Sant'Ana. Indústria de pedra lascada: 1 a 25. Segmentos. 26 a 28. Trapézios. 29 e 30. Triângulos. 31 a 37. Lamelas de dorso (desenhos de F. Martins)

Swines were the most important animals in the diet of the inhabitants of Encosta de Sant'Ana, in terms of the amount of meat consumed (NDR = 26.5%). In the caprine group, whenever it was possible to differentiate, sheep were predominant in relation to goats. It is in this context that we can explain the occurrence of the domestic dog, represented by a single remain, as a guardian of flocks and also as a pet. The considerable abundance of wild rabbits, by far the most common species, reveals the practice of a specialised hunting of this species. This investment is compatible with the capture of other larger animals: in addition to wild boar, aurochs and deer also occur.

Taking into account the archaeological sites of central Lisbon that yielded residential and funerary contexts from the Early Neolithic period, the synthesis table was obtained (table 2).

Up to now, a total of nine absolute datings have been obtained for the Encosta de Sant'Ana site; however, only four are included herein, as the others have a wide confidence interval due to the type of sample (table 3). In order to overcome the inherent reliability issues, two AMS absolute dates were recently obtained on mammal bones from the terrestrial biosphere: Beta-546876 and Beta-546877 (Leitão, Cardoso and Martins, 2021). These results are statistically identical and conclusively confirm the chronology of the Neolithic occupation of Encosta de Sant'Ana — between ca. 5100 and 4900 cal BC. This result is fully consistent with the information provided by the assemblages, specifically the decorative motifs observed on the ceramics. The predominant range of decorative techniques and motifs applied to different vessel types and sizes does not include any decorations made with the edges of mollusc shells, mainly cockle shells (*Cerastoderma edule* L.), which is fully consistent with the so-called Evolved Early Neolithic. The fact that these two samples are also geometrically associated with archaeological structures is an additional factor of interest and improves their contextualisation.

3. Discussion

During the Evolved Early Neolithic period, in the transition from the sixth millennium BC to the following millennium, different types of occupation coexisted in the present-day area of Lisbon's historic centre. Several human groups occupied the region at the time, settling in the lowlands, e.g. the Encosta de Sant'Ana settlement and the occupation of the Alfama riverine area (Armazéns Sommer), as well as in the interfluves, e.g. present-day Bairro Alto, corresponding to a high, open area gently sloping towards the Tagus. All these occupations mirror the organised way in which the resources available in this remarkably diverse geographical area were exploited.

The latter, elevated archaeological site is probably not an isolated case. Its likely counterpart is another site, recorded during the archaeological interventions carried out at the Palácio José Vaz de Carvalho palace, located at the Campo dos Mártires da Pátria square, some 800 m northwest of the Encosta de Sant'Ana site (Reis et al., 2017). The archaeological works conducted by Era Arqueologia S.A. company in 2017 revealed several anthropogenic ditches and a pit excavated in the Miocene substrate and filled with prehistoric deposits related to successive infilling events that are difficult to distinguish in stratigraphic terms. A number of bladelet cores (heat-treated), lithic geometrics (crescents) and several elements with a significant microlaminar character have been ascribed to the Early Neolithic, encompassing all stages of the chaîne opératoire, including flint nodules with some flaking scars, indicative of on-site stone knapping. The record of this occupation, although with limited stratigraphic definition, is probably related to the Baixa inlet and the Vale do Pereiro and Arroios streams, i.e. a northward extension of the occupations surrounding the Tagus inlet corresponding to present-day Rossio and Praça da Figueira squares.

The two funerary deposits unearthed in the subsoil of the present-day city of Lisbon (two pit burials) are of unparalleled relevance to the knowledge of Early Neolithic funerary practices in the Iberian West, and are currently the only ones recorded in Portuguese territory. In both cases, the body was placed in lateral decubitus with arms and legs flexed, a prevailing — and clearly ritual — position in most of the coeval necropolises of southwestern Iberia. The El Retamar site, located on the coast of

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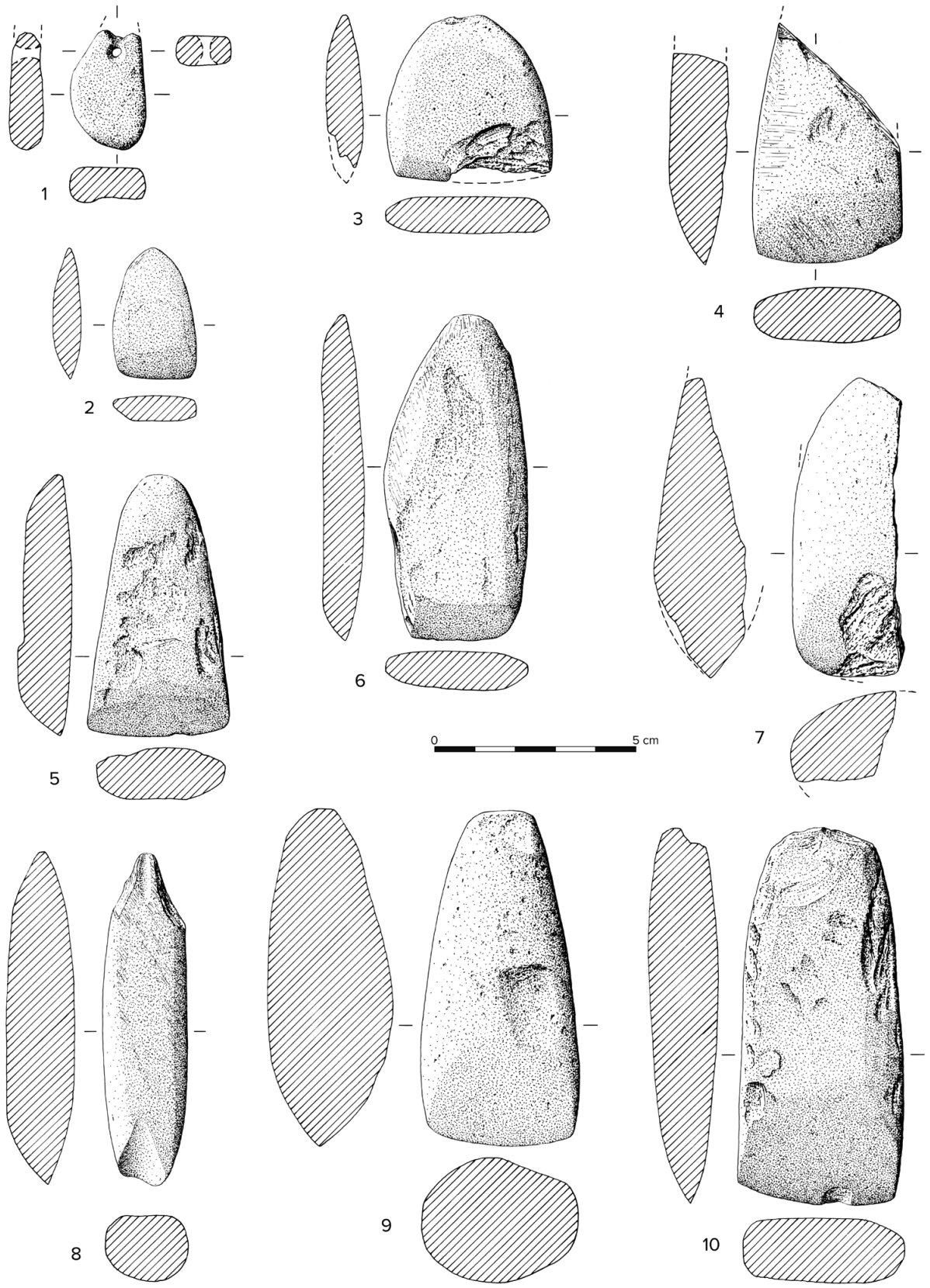

Figure 15. Archaeological materials recovered from Encosta de Sant'Ana. Ornament / votive object: 1. Perforated calcite pendant. 2. Small fibrolite hoe. 3 to 10. Polished stone finds (drawings by F. Martins)

Figura 15. Materiais arqueológicos recolhidos na Encosta de Sant'Ana. Objecto de adorno / votivo: 1. Pendente com perfuração em calcite. 2. Pequena enxó de fibrolite. 3 a 10. Espólios de pedra polida (desenhos de F. Martins)

Archaeological sites explored in central Lisbon		Residential contexts	Funerary contexts	References
Alfama riverine area	**Former Armazéns Sommer**	Sediment filling a burial pit (upper level of the burial). Small lithic and faunal assemblage (exclusively consisting of domestic species). Absence of malacological remains.	Pit burial. One individual in anatomical connection, buries in right lateral decubitus, with flexed limbs and in a NW-SE orientation. Associated, paraboloid ceramic vessel with two handles with horizontal perforation and boquique decoration arranged in garlands.	Ribeiro, Neto, Rebelo and Rocha, 2017 Rebelo, Neto, Ribeiro, Granja and Cardoso, 2017 Cardoso, Rebelo, Neto and Ribeiro, 2018
Colina de São Roque (Bairro Alto)	**Palácio dos Lumiares**	In situ structures: one hearth and some post holes. Abundant lithic industry, with a microlaminar trend. Plain and decorated ceramics. Mammal, malacological and ichthyological remains.		Valera, 2006 and 2014
	Travessa da Boa Hora	Knapped stone and very fragmented ceramics.		Valera, Coelho and Ferreira, 2008
	Palácio Ludovice	Several in situ structures: stone-paved area, *en cuvette* hearths and clay structures. A large number of ceramic fragments, both plain and decorated. Knapped and polished stone items.	Pit burial. Individual in anatomical connection, in dorsal decubitus with legs and arms flexed (foetal position). Associated, large ceramic vessel in situ, placed above the pit (marking the location of the burial), with paraboloid body and base and a cylindrical neck, decorated with a band of impressions on the upper part of the body, incised squared areas around the neck; three ribbon-like handles decorated at the top with a small lug.	Simões, Rebelo, Neto and Cardoso, 2020
Encosta de Sant'Ana		Several in situ structures: subcircular hut, elongated structure, curved structure and several stone-paved areas (heating hearths). Abundant lithic industry, with a micro-bladelet trend; evidence of heat treatment of flint. Abundant lithic industry, with a micro-bladelet trend; evidence of heat treatment of flint. Polished stone items, fibrolite votive hoe and ornament (calcite pendant). Everyday bone industry (awls and needles). Plain and decorated ceramics. Domestic and wild fauna.		Muralha and Costa, 2006 Leitão, Cardoso and Martins, 2021 Leitão, Martins and Cardoso, 2023 Cardoso, Martins and Leitão, 2023

Table 2. Main observations on the Early Neolithic archaeological sites of central Lisbon where archaeological works were conducted

Tabela 2. Principais observações sobre os sítios arqueológicos do Neolítico antigo do centro de Lisboa onde foram realizados os trabalhos arqueológicos

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Lab. ref.	Excavation no.	Type of sample	Age (BP)	δ13C (‰)	Cal. date (2σ) Cal BC	References
Sac-1990	ESA/04 01CC Plano 13	*Mytilus edulis*	6070 ± 60	-0,12	5210-4810	Angelucci et al., 2007
Sac-2013	ESA 04/06 Sector E, Sub.S. I K-51 até Pl. 16	charcoal	6310 ± 100		5468-5083 cal BC (para 68.3%); 5477-5038 cal BC (para 95.4%)	Leitão, Cardoso and Martins, 2021
Sac-2014	ESA/Sector E VII	charcoal	6740 ± 100		5733-5558 cal BC (para 68.3%); 5831-5479 cal BC (para 95.4%)	
Beta-546876	ESA/Sector E V - I-38 até Pl. 9	bone (*C. elaphus*)	6090 ± 30		5074-4909 cal BC (para 89.8%); 5204-5171 cal BC (para 5.6%)	
Beta-546877	ESA/Sector E VII - C-19	bone (*Ovis/capra*)	6120 ± 30		5083-4961 cal BC (para 63.5%); 5208-5145 cal BC (para 22.8%); 5139-5092 cal BC (para 9.1%)	

Table 3. Encosta de Sant'Ana. Radiocarbon dating results

Tabela 3. Encosta de Sant'Ana. Resultados de datação por radiocarbono

Cadiz (Spain), near Puerto de Santa María, stands out among all the parallels. An open settlement was unearthed here, on a ridge situated some 800 metres away from the sea. Within the inhabited space, featuring a significant number of structures related to different domestic activities, two graves were recorded, corresponding to the deposition of bodies in shallow pits dug into the ground (Ramos Muñoz and Lazarich González, 2002). The first burial contained the very incomplete remains of one individual; the second included the remains of two individuals, the older one quite complete, except for the skull, which was displaced during the deposition of the more recent individual, only represented by the mandible (Bueno Sánchez, 2002). The anatomical connection evidenced by the bones of the most complete individual indicates a deposition in lateral decubitus, with the legs flexed and at least one of the arms (the right one) placed alongside the body, according to the available photograph. A date obtained on shells recovered from a hearth feature, as can be inferred from the description provided (Stipp and Timers, 2002), yielded a result of 6780 ± 80 BP. This result was calibrated by subtracting 380 ± 30 years in order to correct the ocean reservoir effect, resulting in a dating to 5470-5143 cal BC at 2σ (Zilhão, 2001: table 1). It is surprising that the leading archaeologists did not seek to obtain a direct dating on a fragment of human bone, avoiding all the uncertainty resulting from a dating like the one performed at such an important site. In any case, it is clear that these are two burials from the Early Neolithic period and, consequently, coeval with the Lisbon burials in question.

Other Early Neolithic burials from the Meseta and the Ebro Valley have been reported and scrutinised (Guerra et al., 2016). Just like in Lisbon, most of them were detected as a result of archaeological interventions designed to mitigate the archaeological impact of public works, urban development or industrial projects. However, the information obtained from the diverse studies addressing these archaeological sites is disparate and unbalanced. In the majority of cases, these are closed pit burials consisting of primary individual funerary contexts, in which the individual was buried in right lateral decubitus position. Fewer burials feature individuals in left lateral decubitus and there was only one case where the individual was buried in a sitting position. The absence or presence of associated archaeological remains is also different for each of the sites (Guerra et al., 2016).

In Lisbon, each of the identified burials had a vessel with a closed neck. In the case of the Armazéns Sommer burial, the vessel featured Boquique decoration with garland motifs and was placed at the bottom of the pit, not on top of it, as was the case at the Palácio Ludovice, probably to mark its location, even though it was situated in the immediate vicinity of the inhabited space (Cardoso et al., 2022). This vessel displays incised and impressed decoration, with the squared motifs spread across its surface clearly standing out. Its closest parallel is the vessel found at the Salemas (Lousa) settlement, on display

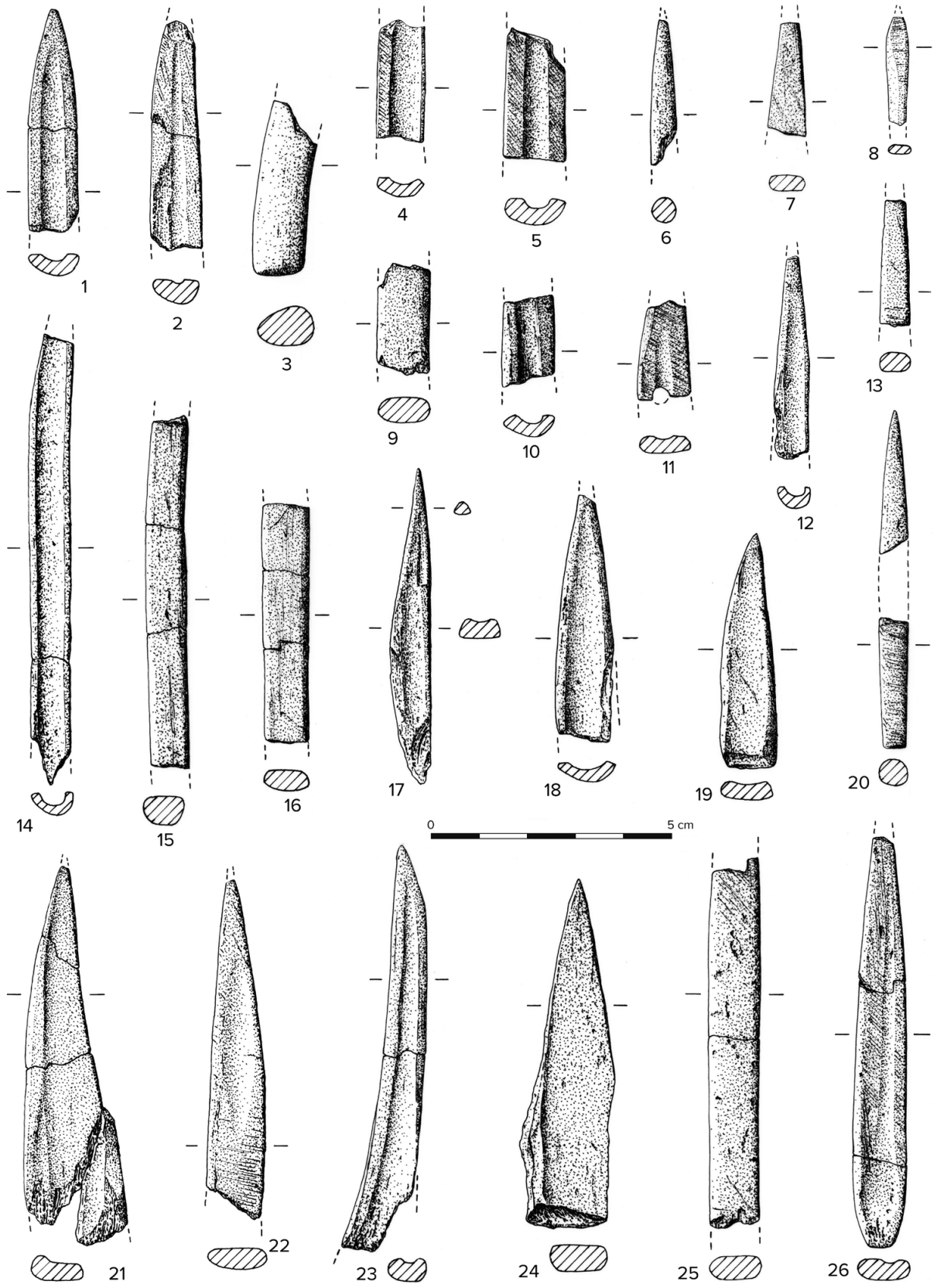

Figure 16. Archaeological materials recovered from Encosta de Sant'Ana. Bone industry (drawings by F. Martins)

Figura 16. Materiais arqueológicos recolhidos na Encosta de Sant'Ana. Indústria de osso (desenhos de F. Martins)

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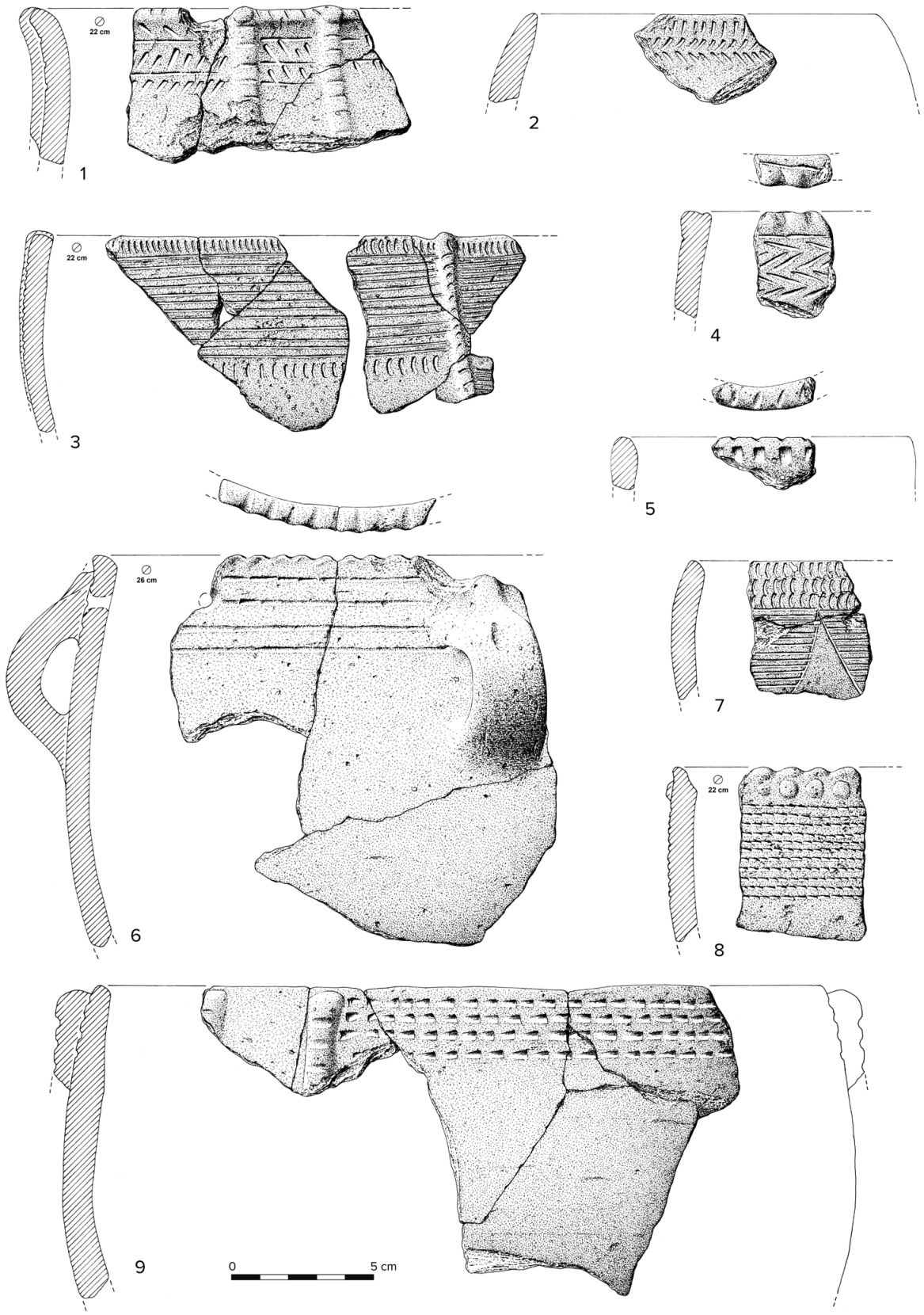

Figure 17. Archaeological materials recovered from Encosta de Sant'Ana. Decorated Early Neolithic ceramics (drawings by F. Martins)

Figura 17. Materiais arqueológicos recolhidos na Encosta de Sant'Ana. Cerâmicas decoradas do Neolítico Antigo (desenhos de F. Martins)

at the LNEG Museum. Its relevance prompted a dedicated publication shortly after it was recovered and restored (Castro and Ferreira, 1959). This vessel also features a paraboloid body with three handles at the inflection; the inflection line is more angular than on the Lisbon vessel and is also decorated with double oblique impressions (Guilaine and Ferreira, 1970: fig. 13; Spindler, 1978: abb. 6). The affinities of the latter — particularly the paraboloid shape of its body — with certain European Neolithic groups were highly valued at the time, which is understandable since it was unique in Portuguese contexts back then. Although even today this feature is exceptional among the complete Early Neolithic vessels known in Portuguese territory, it matches the coeval vessels recovered in the 1879/1880 excavations conducted at the Casa da Moura cave (Carreira and Cardoso, 2001/2002: fig. 44, no. 3; 48, nos. 1 and 2), which show many similarities with the known vessels from the interior basin of the Mondego River (Valera, 1998: pl. 4, nos. 2 and 5; pl. 5, no. 1; pl. 7, no. 4).

Knowledge of the Early Neolithic absolute chronology in the Lisbon region has made remarkable progress in recent years (Sousa, 2017; Leitão, Cardoso and Martins, 2021).

An absolute AMS dating on a long bone sample was obtained for the pit burial unearthed at the former Armazéns Sommer (Cardoso et al., 2018). After calibration, it yielded 5200-4890 cal BC at 2σ. This result is statistically identical to those obtained from the aforementioned samples of terrestrial biosphere fauna from the Encosta de Sant'Ana. The vessel decorated using the Boquique technique recovered from this burial is consistent with the conclusions advanced by some authors (Carvalho, 2008) regarding the timing of the appearance of the Boquique technique during the transition from the sixth to the fifth millennia BC in Western Iberia. It thus corresponds to a phase of full diversification of the techniques and decorative patterns displayed by the respective ceramic productions.

Regarding Palacio Ludovice, one of us (J.L.C.) selected samples for dating, which were sent to two different laboratories (University of Waikato Laboratory, New Zealand, and Beta Analytic Inc.), but unfortunately they lacked collagen that could be used for dating (Simões et al., 2020), although from a typological point of view there are no doubts regarding the ascription of these finds to the Evolved Early Neolithic.

In order to provide a regional overview, figure 18 shows the geographical distribution of radiocarbon-dated Early Neolithic sites, both residential and funerary, and table 4 summarises the results.

In addition to the restricted geographical area under study (the urban centre of the city of Lisbon) and the regional overview of Early Neolithic sites with radiocarbon datings shown in Figure 18, we would also highlight the funerary contexts of the following caves, due to their importance on a regional scale: Furninha Cave, Peniche (Cardoso and Carvalho, 2010/2011); Casa da Moura Cave, Óbidos (Carreira and Cardoso, 2001/2002); Senhora da Luz Caves, Rio Maior (Cardoso, Ferreira and Carreira, 1996); Abrigo Grande das Bocas rockshelter, Rio Maior (Carreira, 1994); Caldeirão Cave (Zilhão, 2021), and the different sites of the Estremadura Limestone Massif, some of which are funerary (Carvalho, 2008). Closer to Lisbon, the dating of some human remains from the natural cave of Correio Mor (Loures) (Cardoso, 2010) proves its funerary use during the full Early Neolithic period.

In the region between the Tejo and Sado Rivers, and in addition to the Casal da Cerca settlement, mentioned in table 4, Early Neolithic funerary contexts in natural caves are known from Lapa do Fumo (Cardoso and Martins, 2018) and Lapa do Sono Caves, in Sesimbra (Fernandes et al., 2015).

The funerary practices of these Early Neolithic communities are still scarcely known, and it is quite possible that they simply involved the deposition of corpses in the floor of caves, not unlike the subsequent Middle Neolithic contexts of the same region.

We would further mention the existence of burials in open dwelling sites, e.g. Salemas (Loures) and Lameiras (Sintra), as indicated by the human remains recovered therein, associated to the irregularities and hollows of the Cretaceous limestone lapies outcropping at both sites (Cardoso, 2010).

These populations occupied gorge/defile areas or higher grounds, e.g. the settlements of Salemas (Loures), in the former case, and Moita da Ladra (Vila Franca de Xira), in the latter. Both settlements controlled passages between the harsher,

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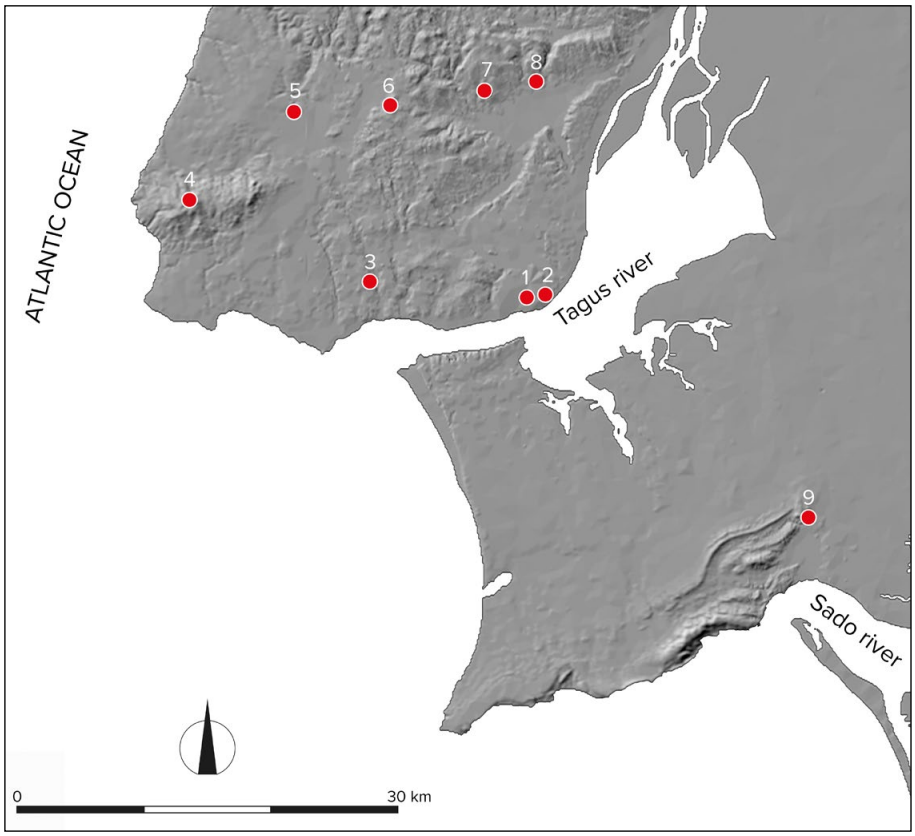

Figure 18. Radiocarbon-dated Early Neolithic dwelling sites in the Lisbon region: 1. Encosta de Sant'Ana. 2. Armazéns Sommer. 3. Carrascal. 4. São Pedro de Canaferrim. 5. Lameiras. 6. Olelas. 7. Correio-Mor. 8. Salemas. 9. Casal da Cerca

Figura 18. Sítios de habitat do Neolítico antigo com datações radiocarbónicas na região de Lisboa: 1. Encosta de Sant'Ana. 2. Armazéns Sommer. 3. Carrascal. 4. São Pedro de Canaferrim. 5. Lameiras. 6. Olelas. 7. Correio-Mor. 8. Salemas. 9. Casal da Cerca

hilly limestone domain and the highly fertile lowlands adjacent to the vast estuary of the Tagus River (Cardoso, Carreira and Ferreira, 1996). The settlement of São Pedro de Canaferrim, in the Sintra range, shares a comparable setting (Simões, 1999).

This was also the case in the Arrife area of Torres Novas (Zilhão and Carvalho, 1996; Carvalho, 2008), where settlements were established in ecotone zones, from where both the lowlands, suitable for agriculture, and the more rocky and hilly areas, used for herding, could be accessed (Cardoso, 2015b).

4. Conclusions

1. This paper presents, for the first time, the results of the archaeological investigations conducted up to now in the subsoil of Lisbon's historic centre, with regard to the Early Neolithic residential and funerary sites. These sites can be grouped into two main types of palaeoenvironment:

- The riverside environments along the former northern shore of the Tagus Estuary. The human occupation of these environments is evidenced by the Armazéns Sommer and the Encosta de Sant'Ana, on the former estuarine branch corresponding to the present-day lower part of Lisbon's historic centre, i.e. the Rossio, Praça da Figueira and Martim Moniz squares. These sites yielded remains of a residential and funerary nature in the former case, and only residential in the latter.
- Ecotone environments. These are represented by two terraces facing the Tagus, separated by the wide estuarine branch that penetrated the lower part of the city. One of the terraces corresponds to the São Roque hill interfluve, in Bairro Alto, where there was an extensive open settlement, recorded during several archaeological

Lab. Ref.	Type of sample	Context	Conventional date (BP)	Cal. date (2σ) Cal BC*	References
LAMEIRAS LAPIES					
OxA-29109	Bone (*Ovis*)	E.U. 53	6497 ± 34	5507-5375	Davis and Simões, 2016
OxA-29110	Bone (*Ovis*)	E.U. 53	6494 ± 34	5517-5374	
OxA-24829	Seed (*Hordeum vulgare*)	E.U. 39	6424 ± 32	5473-5331	López-Doriga, 2015
OxA-24832	Seed (*Triticum dicoccum*)	E.U. 27	6381 ± 34	5468-5309	
OxA-24830	Seed (*Hordeum vulgare*)	E.U. 10	6327 ± 32	5367-5223	
OxA-24833	Seed (*Triticum monoccocum*)	E.U. 26	6310 ± 33	5352-5219	
OxA-29111	Bone (*Ovis*)	E.U. 27-2	6314 ± 33	5357-5220	
OxA-24831	Seed (*Triticum nudum*)	E.U. 26	6256 ± 32	5315-5079	
OxA-24533	Bone (*Homo*)		6256 ± 35	5315-5078	López-Doriga and Simões, 2015
OxA-29234	Bone (*Ovis*)	E.U. 53	6186 ± 36	5286-5019	Davis and Simões, 2016
SÃO PEDRO DE CANAFERRIM					
OxA-24906	Seed (*Triticum dicoccum*)	E.U. 57	6257 ± 35	5316-5078	López-Doriga, 2015
OxA-24894	Seed (*Triticum monoccocum*)	E.U. 70-1	6240 ± 45	5313-5061	
Beta-164713	Charcoal (*Erica umbellata*)	E.U. 70-1	6240 ± 40	5310-6066	
Beta-146714	Charcoal (*Erica umbellata*)	E.U. 49-7	6200 ±40	5295-5045	Simões, 2003
OxA-24834	Seed (*Hordeum vulgare*)	E.U. 62	6179 ± 33	5221-5026	López-Doriga, 2015
OxA-24835	Seed (*Triticum nudum*)	E.U.49	6176 ± 32	5219-5030	
ICEN-1151	Charcoal	E.U. 150/-152	6020 ± 60	5195-4730	Simões, 1999
ICEN-1152	Charcoal	E.U. (-185)	6070 ± 60	5207-4836	
CARRASCAL					
Beta-276401	Bone (*Bos taurus*)		6280 ± 40	5358-5080	Cardoso, 2015a
Beta-296583	Bone (*Sus sp.*)		6270 ± 40	5324-5077	
Beta-276403	Bone (*Bos primigenius*)		6230 ± 40	5306-5061	
Beta-296581	Bone (*Sus sp.*)		6190 ± 40	5290-5026	
Beta-296582	Bone (*Ovis / Capra*)		6200 ± 40	5295-5045	
Beta-29684	Bone (*Sus sp.*)		6160 ± 40	5217-5000	
CORREIO-MOR CAVE					
ICEN-1099	Charcoal	Hearth	6350 ± 60	5468-5221	Cardoso, Carreira and Ferreira, 1996
Sac-1717	Human bone	Burial	6330 ±60	5472-5209	Cardoso, 2010
SALEMAS					
ICEN-351	Human bones		6020 ± 120	5230-4670	Cardoso, Carreira and Ferreira, 1996
CASAL DA CERCA					
Beta-235886	Charcoal	Qs.N-O/8-9; C.2 base	6160 ± 50	5284-4958	Silva and Soares, 2014
MAGOITO					
ICEN-424	*Patella spp.*		6080 ± 80		Soares, 2003
ICEN-425	*Patella spp.*		6030 ± 80	4590-4240	
ICEN-471	*Thais haemastoma*		5970 ± 120	4610-4040	
ICEN-426	*Mytilus sp.*		4720 ± 45		
ICEN-427	*Mytilus sp.*		4690 +/ 60	3020-2660	
ICEN-539	*Mytilus sp.*		4890 ± 45		
ICEN-540	*Mytilus sp.*		4970 ± 45		

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FORMER ARMAZÉNS SOMMER					
Wk-45573	Long bone (human)	Pit burial	6315 ± 24	5200-4890 cal BC	Cardoso, Rebelo, Neto and Ribeiro, 2018
ENCOSTA DE SANT'ANA					
Sac-1990	*Mytilus edulis*	ESA/04 01CC Plane 13	6070 ± 60	5210-4810	Angelucci et al., 2007
Sac-2013	Charcoal	ESA 04/06 I - K-51 through Pl. 16	6310 ± 100	5468-5083 cal BC (68.3%) 5477-5038 cal BC (95.4%)	Leitão, Cardoso and Martins, 2021
Beta-546876	Bone *(C. elaphus)*	ESA/Sector E V - I-38 through Pl. 9	6090 ± 30	5074-4909 cal BC (89.8%) 5204-5171 cal BC (5.6%)	
Beta-546877	Bone *(Ovis / capra)*	ESA/Sector E VII - C-19	6120 ± 30	5083-4961 cal BC (63.5%) 5208-5145 cal BC (22.8%) 5139-5092 cal BC (9.1%)	

Table 4. Early and Middle Neolithic dates from the Lisbon region (after Sousa, 2016/2017, adapted and updated)

Tabela 4. Dados do Neolítico Antigo e Médio da região de Lisboa (após Sousa, 2016/2017, adaptados e atualizados)

interventions (Palácio Ludovice; Palácio dos Lumiares; Travessa da Boa Hora), where various structures of a residential and funerary nature have been found. The other terrace corresponds to the Campo dos Mártires da Pátria interfluve, which yielded less significant remains.

2. All the findings resulted from archaeological excavations carried out as part of Lisbon's urban redevelopment and conducted by archaeology companies (Neoépica, Lda. and Era-Arqueologia, SA.) or archaeology teams from the Lisbon municipality. These activities, undertaken as part of preventive and salvage interventions triggered by urban redevelopment, have been decisive in the detection and knowledge of prehistoric contexts in the urban centre of the city, thus contributing to the progressive reconstitution of the occupation of this territory.

3. The obtained results are indicative of the organised and coordinated way in which the resources available in this remarkably diverse geographical area were exploited by communities divided into small but interdependent family-based clusters. As such, the different types of location strategy resulted from the strategic importance of the sites, either on the heights or along the banks of the former Tagus Estuary or on the inlets existing at the time, which were rich in resources, permanently available and easy to gather all year round.

Concurrently, resources located in adjacent areas, at higher altitudes, were exploited as well. This explains the presence of hunted species (the presence of deer, *Cervus elaphus* L., has been confirmed), along with caprine pastoralism, *Ovis aries*/*Capra hircus*. The practice of agriculture has also been evidenced, given the presence of bladelets bearing sickle sheen, in addition to other evidence.

4. The identification of individual primary funerary contexts, close to residential contexts — the only ones published so far in Portugal —, with identical typologies, at the Armazéns Sommer and the Palácio Ludovice, is particularly noteworthy. These are two pit burials, with the bodies buried in lateral decubitus with the arms and legs flexed; both deposits were associated with large decorated vessels.

5. The absolute Early Neolithic chronology in the Lisbon region has made remarkable progress in recent years, as shown by the summarised results and their regional framework included in table 4. The absolute dates indicate, for a confidence interval of around 95%, occupations within a time interval between 5400 and 4900 BC.

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