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A ship's timber from D. Luis I Square (Lisbon, Portugal): rare evidence of a Roman ship in the Portuguese coast?

La madera de un barco procedente de la plaza D. Luis I (Lisboa, Portugal): ¿rara evidencia de un barco romano en la costa portuguesa?

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Abstract: This paper presents the preliminary results of the survey and evaluation of a ship timber, identified during an archaeological excavation at D. Luís I Square, in Lisbon. The timber was found in a harbor context, along with other Roman artifacts, ranging from the first century B.C. to the fifth century A.D. The mortise-and-tenon joinery and timber measurements suggest that this was part of a classical antiquity ship, probably a longitudinal piece, like a keel or plank. In the absence of other contemporaneous ship remains in the Portuguese coast, this timber is a singular artifact, with a high scientific value.

Key words: Lisbon, Roman Period, keel/plank, mortise-and-tenon, Atlantic.

Resumen: se presentan los resultados preliminares del registro y evaluación científica de un elemento de madera, recuperado durante los trabajos de excavación de la Pza. Don Luis I, en Lisboa. Esta pieza fue hallada en un contexto arqueológico portuario, donde también se registraron materiales de época romana, con una cronología entre el siglo a.C. y el siglo v d.C. La morfología y el sistema de unión (mortaja-espiga-clavija) confirman que este elemento pertenecía a la estructura de un navío de la Antigüedad clásica, correspondiéndose con una pieza longitudinal: una quilla o una tabla del forro. En ausencia de otros buques coetáneos en la costa portuguesa, este elemento de madera es una pieza singular, de gran valor científico.

Palabras clave: Lisboa, época romana, quilla/tabla del forro, mortaja-espiga-clavija, Atlántico.

A ship timber from D. Luís I Square (Lisbon, Portugal): rare evidence of a Roman ship in the Portuguese coast?

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Introduction

Fig. 1 – Site location (extracted from C.M.P., sheet 431, IGeoE; Lisbon topographic survey).

Between February and March 2013 the Portuguese Centre for Global History (CHAM) performed the recording and scientific evaluation of a timber identified during the archaeological excavation held by ERA-Arqueologia, S.A. at the D. Luís I Square, where a car park was being built. The D. Luís I Square is located in the riverside area of Lisbon (fig. 1).

Tree-species identification

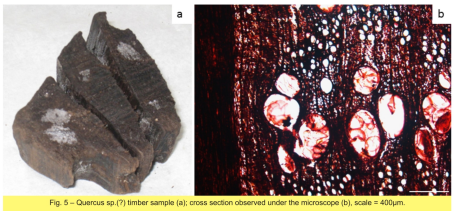

Fig. 5 – Quercus sp.(?) timber sample (a); cross section observed under the microscope (b), scale = 400µm.

Tree-species analyses revealed that Quercus spp., probably *Q. faginea* or *Q. pyrenaica*, have been used; these species can easily be found in the Iberian Peninsula (fig. 5).

Contextualization and description

This timber was found in a context related to port functions, c. 3,7 m below the mean sea level. All materials (mostly amphorae) recovered in this context date from the Roman period, between the 1st century BC and the 5th century AD (Parreira *et alii*, 2013; fig. 2, 3 and 4).

The timber measured around 9,36 m in length, had an upper section of 33,5 x 14 cm (fig. 6) and was broken into two main pieces and other small fragments of limited relevance.

These archaeological remains must have suffered the effects of complex and intense hydrodynamics. In fact, this context only reached sedimentary stability after the fifth century AD, at a time when this area most likely wasn´t regularly used. In the 17th century, the construction of a tidal grid, also recorded during the archaeological intervention, may have been a decisive contribution to their stabilization and preservation.

Fig. 2 – Detail of the archaeological context.

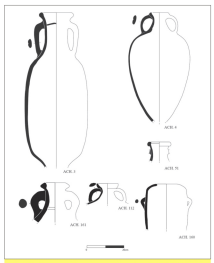

Fig. 3 – Recovered amphorae (Parreira *et alii*, 2013: 752).

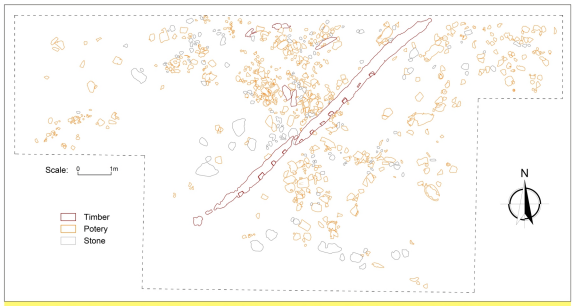

Fig. 4 – Plan of the Roman archaeological context from D. Luís I Square (vectorized from rectified photographic setting held by ERA-Arqueologia, SA).

Shipbuilding techniques

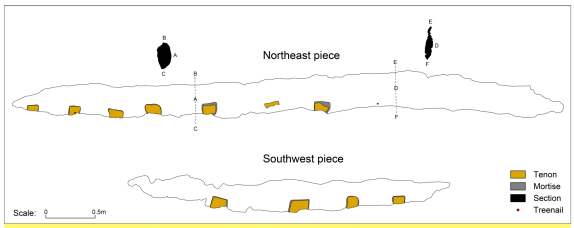

Fig. 6 – Drawing of the two wood pieces, showing shipbuilding system details: mortise-and-tenon joints and wooden treenails.

Fig. 7 – Tenon joints – detail of the treenail blocking the tenon joint.

The timber was connected to other parts by means of a system of mortise-and-tenon joints, in some cases with wooden treenails. The distance between tenons (measured center-to-center) is irregular, ranging from 42 to 63 cm. The tenons' width also varies, mostly between 11 and 14 cm. The length is likely to exceed 11 cm and the thickness reaches 2,8 cm. Only two treenails were observed, measuring 1,7 and 1,8 cm in diameter (fig. 7).

The morphology and the nailing system confirm that this element was part of a ship's structure, and might correspond to a longitudinal piece: a keel or plank. The first hypothesis is the most likely, considering the dimensions of large roman ships, such as Madrague de Giens, where the garboard average thickness was around 12 cm (Pomey *et alii*, 1978: fig. 10), and thus lesser than the D. Luís I Square timber (about 14 cm).

The fastening pattern dates this element to classical antiquity. This type of fastening was used throughout the Mediterranean world in vessels of different sizes. In shell-first tradition, the hull planks and the keel were systematically connected with mortise-and-tenon joints, which were blocked with treenails placed perpendicularly to the timbers

The distance between the fastening components suggests a later chronology. In fact, if at an initial phase the tenon joints were distributed in a regular way, the system changed substantially during the Roman period (Pomey *et alii*, 2012: fig. 90). The progressive size reduction of the tenon joints is related to an increase of the distance between each connection point. This development is currently explained by a gradual transition from a shell-first to a skeleton-first technology, which occurred during the 1st millennium. At a more detailed level, this timber has another important characteristic: only two connection points feature wooden treenails to block the tenons, which also indicates later chronologies.

Concluding remarks

In fact, the fastening system of the timber recovered at D. Luís I Square has parallels in ships from the final phase of the Roman period. However, it features a rather unique characteristic: the large size of the tenon joints. This particular feature might be related to the issue of roman shipbuilding adapted for Atlantic navigation, for which no archaeological contexts are currently known. Despite its poor condition, it is a singular remain, with an exceptional scientific value. Its study just confirms the present lack of knowledge about ships and Atlantic navigation in classical antiquity

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