

The context of Ria de Aveiro F (Ílhavo, Portugal): confluence of shipbuilding traditions between Late Middle Ages and Early Modern Age

Introduction

The Ria de Aveiro is situated on a coastal and estuarine region in the Northwest of Portugal, where the Vouga river lies along with other small water courses. It had its origins around the 10th/11th centuries, when a sandy shoal began to form in Espinho area heading South. Thus, a coast in the shape of a large bay between Vila Nova de Gaia and the Cape Mondego was gradually being transformed into a straight coast, as can be seen today (Freitas e Andrade, 1998:68-69).

The Ria de Aveiro shipwreck (RAVF) was discovered in February of 2002 as part of the expansion of the port of Aveiro, during the archaeological monitoring of the dredging construction of *roll-on/roll-off* terminal. The results of radiocarbon analyses of the early traces of wood dated the context between 1280 and 1460 (Rodrigo, 2002:1).

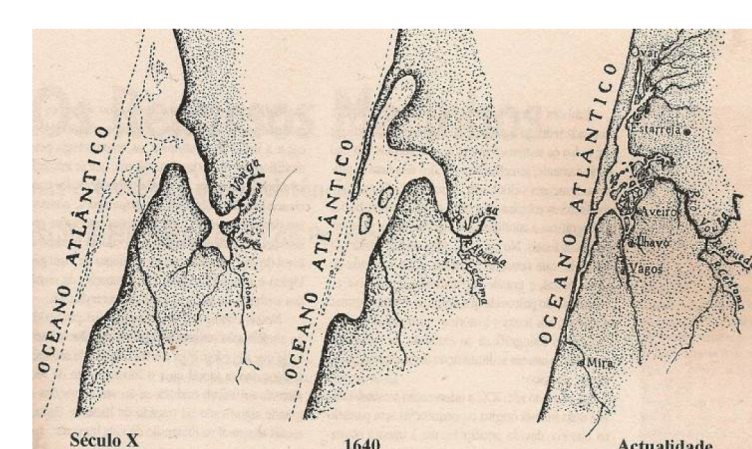
The place where the wreck occurred was a space that over the centuries between has changed back and forth from silted area to navigation channel. These changes were caused by the increase or decrease of sediment deposition, influenced by the



Geographical location of Aveiro (Google Earth, 05/09/2014).



Aerial view of the Ria de Aveiro (intervened area).



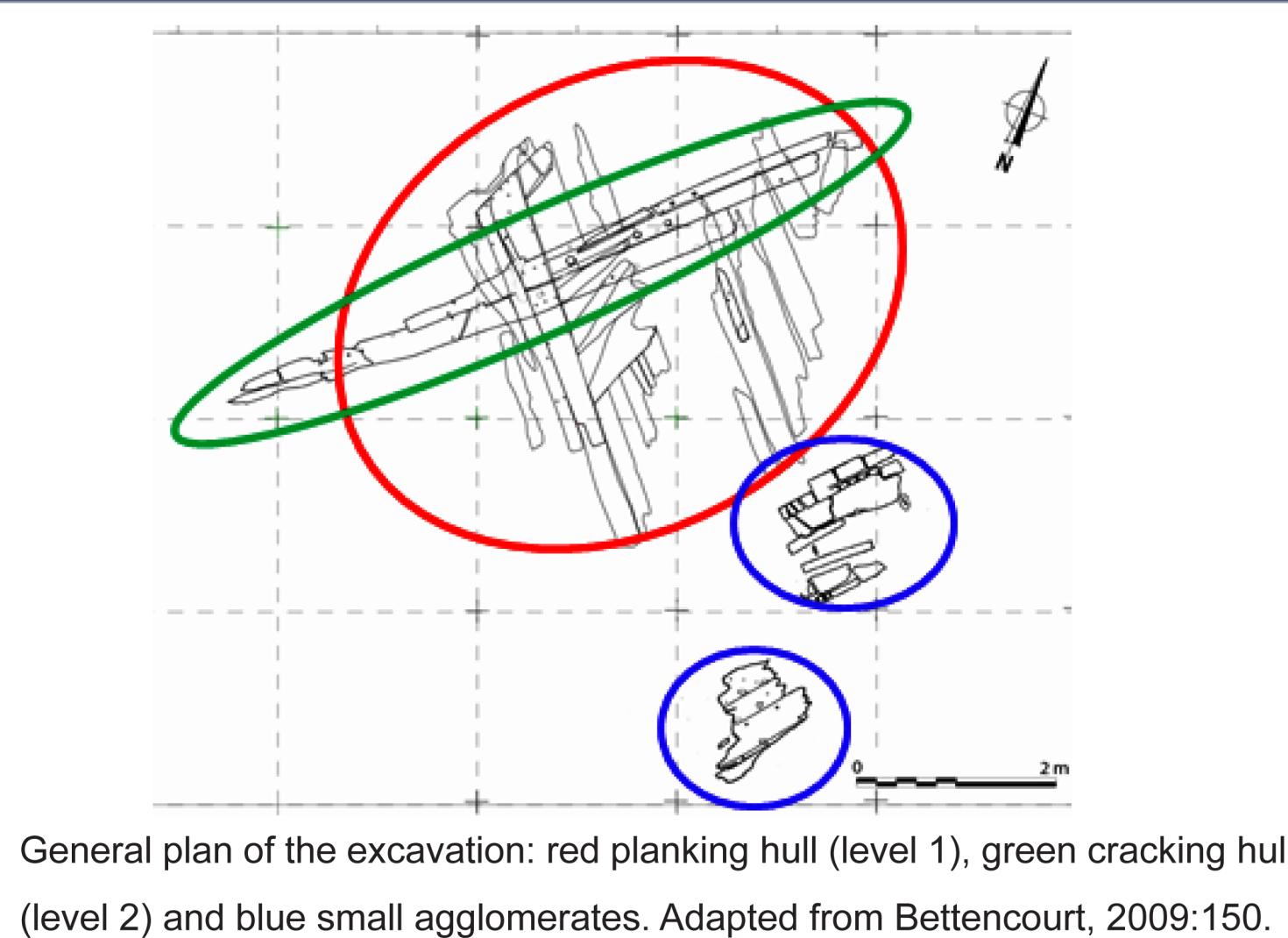
Formation of the Ria de Aveiro (Freitas e Andrade, 1998:69)

The Site

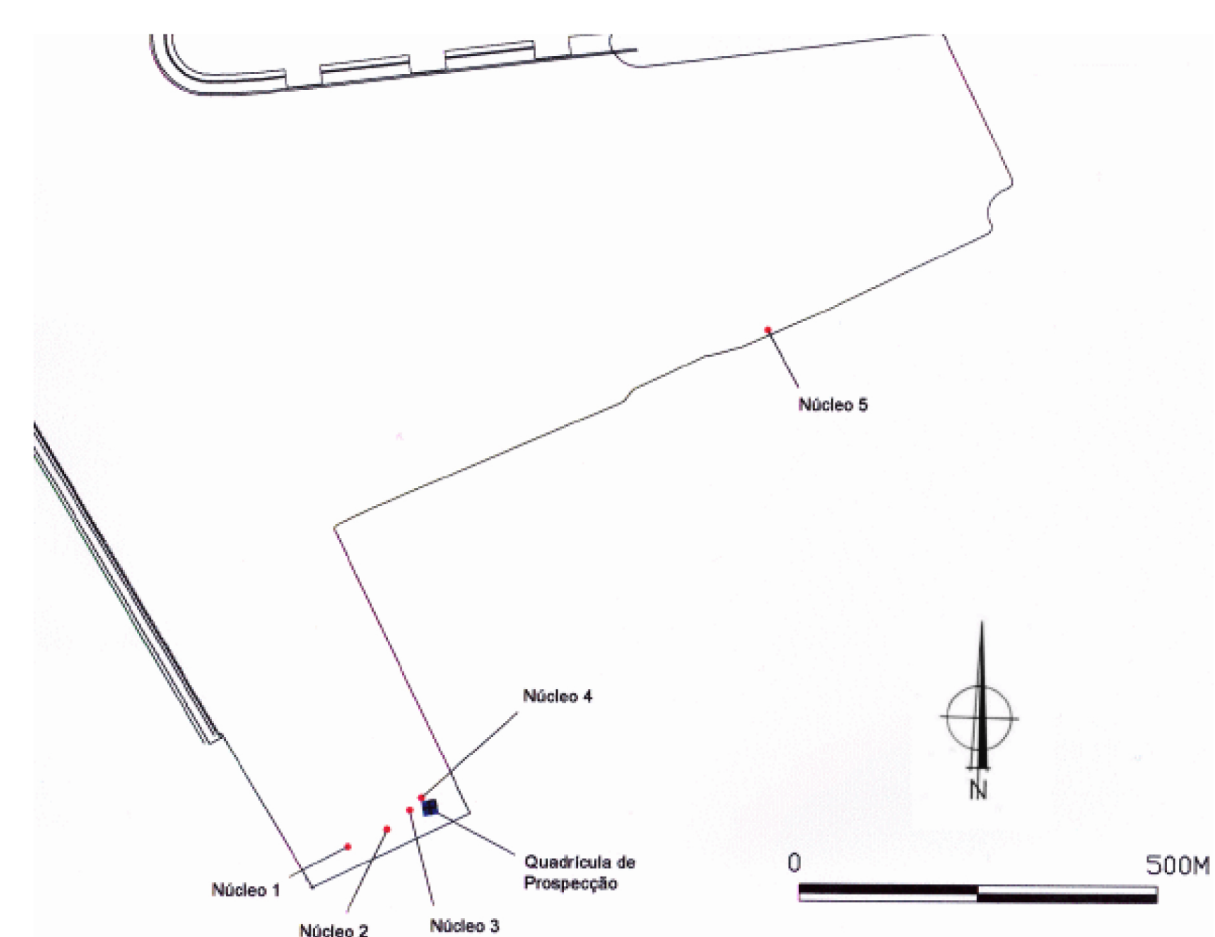
The RAVF context consisted in two major structures, wood cores, one in planking hull and another in cracked hull, forming the central core, but also a number of other small agglomerates of wood, some still in connection and other dispersed by the local. In addition to these, five more isolated cores were identified (Rodrigo, 2002:8-10).

The core of the planking hull (level 1) corresponded basically to a stern with a maximum length of 3,8 m and was constituted by a sternpost, Y-shaped floor timbers and part of the starboard and port side planking. This planking was smooth and the fastening were in iron, with no trace of wooden dowels (Rodrigo, 2002:5). In the port side besides the planking fixed to the Y-shaped floor timbers and sternpost, there was a set of six planks that appeared to be the continuation of the planking board, but that were not physically connected to it. The starboard had three wooden planks under the sternpost, overlapping one another, forming a cracked hull (Rodrigo, 2002:6).

The partially visible cracked structure (level 2), was constituted by three planks, that are 3 and 4 cm thick 14, 30 and 23 cm with respectively, and a total length of the set of 6,30 m (Rodrigo, 2002:8).



General plan of the excavation: red planking hull (level 1), green cracking hull (level 2) and blue small agglomerates. Adapted from Bettencourt, 2009:150.



Location of the cores identified in the course of archaeological intervention (Rodrigo, 2002:45).

The Ship

Sternpost

The sternpost was preserved *in situ* and still in connection with some planks, corresponding to an incomplete single piece with 1,59 m length by 11,5 cm thick in the extension of the keel, and 13,5 cm in the start of the sternpost, and 21 cm and 34cm wide respectively. It had carvings for fixing the rudder fittings that would be axial. Along part of each side, there was a rabbet about 1,5cm deep. The fastening was made with foursquare section (1x1 cm) iron nails.



Sternpost (port view).

Framing

Most of it was Y-shaped floor timbers (only four *in situ*) and there were also some frames scattered and torn by dredge action. The fastening system was composed entirely foursquare section (1x1cm) iron nails that were placed in a previously made hole and in the oblique face of the bow or stern towards the keel. The frames and futtocks had hook scarfs, 1,5 cm deep, linking their ends. These links were reinforced by three foursquare section iron nails.



Y-shaped floor timbers found *in situ*.

Planking hull

The identified planks had between 6 and 38 cm width, and 3 and 5 cm thick. The original length was not preserved, although the maximum extension registered was 2,97 m, and the average was around 1 m. The entire fastening was in foursquare section (1x1 cm) iron nails using together two or three nails by connection. It was also identified a fragment of the garboard plank, faceted and with chamfers on two of the faces so it would fit rabbet.



Garboard plank and detail of the chamfers.

The Ship

Cracking hull

The identified planks overlapped length wise forming a cracked hull and had from 13 to 31 cm width and 3 to 4 cm thick. The length varied according to their state of preservation with the having 6,30 m. This set belonged to the bulwark area, since there were found some oarlocks with their respective shutters plus a thole with a cylindrical section. The fastening should be a mix of foursquare section (1x1 cm) iron nails and wooden dowels with 2 cm of diameter.



Photomosaic of the greater core of cracking elements.

Mast step

It was found quite lacerated at both ends, with 2,07 m long, 41 cm wide and 35 cm thick. In the lower surface, it had a jagged that fit over the upper side of the frames, pressing them against the keel. On the upper surface, it had the sink of mast step of rectangular shape (47x21x17cm), where the heel tenon of the mast would rest. The fastening system was mix foursquare (1,5 cm x 1,5 cm) and circular section (2 cm diameter) iron nails and wooden dowels with 2 cm diameter.



Mast step (lower surface view).



Sink of the mast step.

Block

Standing blocks - three dead eyes, one heart block and two toggles.
Running blocks - three tackle blocks and one block.



Dead eye.



Heart block.



Toggles.



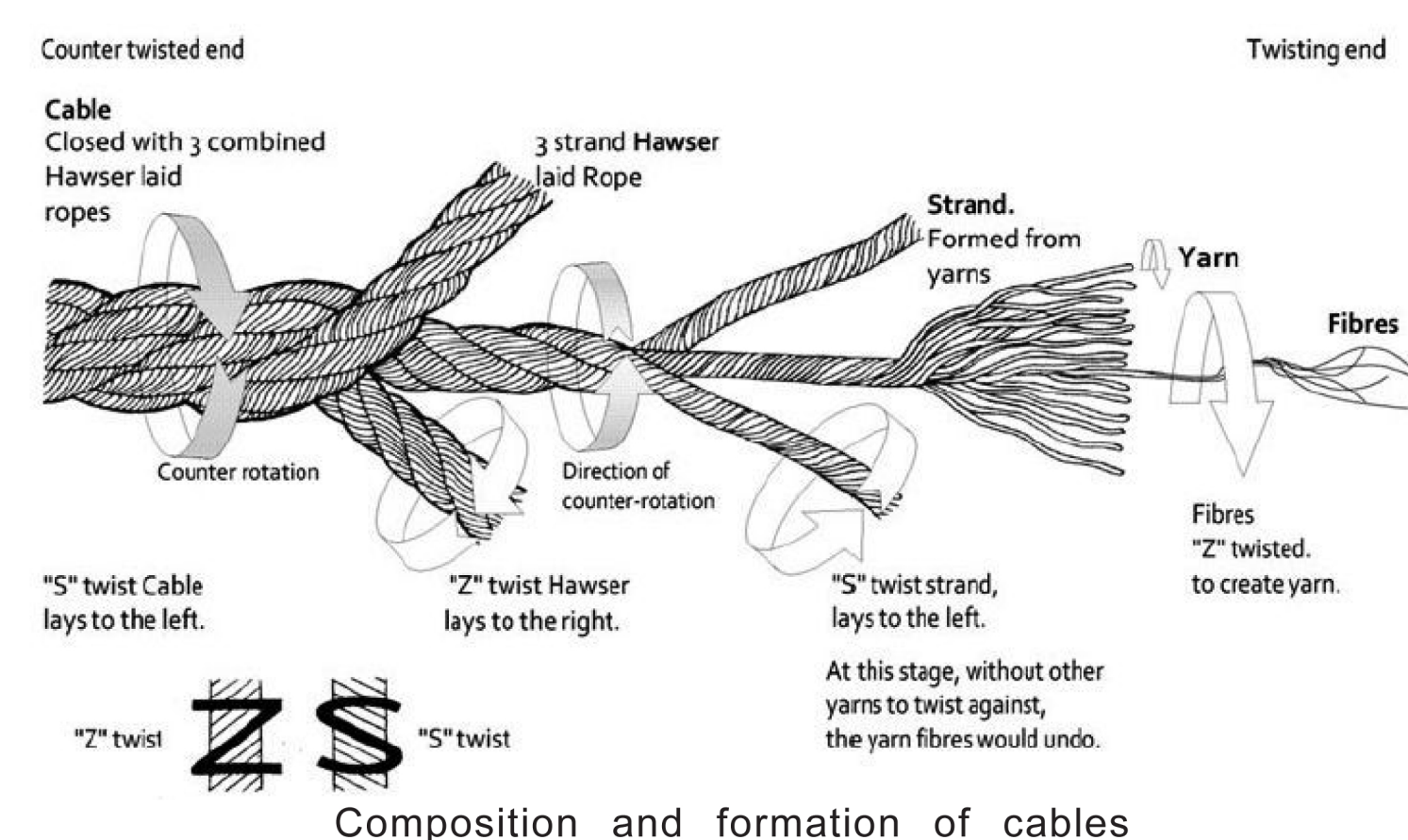
Tackle block.



Block.

Rigging

Were analysed 81 fragments: 48 foxes of three, 28 spunyarns, 1 cable, 4 foxes of four and a boltrope (hand sewing).



Composition and formation of cables



Several types of identified cables.



Boltrope (mãozinha).

Conclusions

The hook scarfs are characteristic of the Mediterranean between 14th and 17th centuries, as we can see in the ships *Culip VI* (mid 14th century), *Yassi Ada* (16th century) and *Sardinaux* (late 17th century). The fastening system is almost entirely in iron, also a featured from the Mediterranean that finds parallel in the ships above mentioned and also in *Villefranche-sur-Mer* (16th century), and *Calvi I* (late 16th century). The presence of the sternpost as a single piece and the fact that the mast step appears to have been notched as a expanded part of the keelson are characteristics of the Atlantic (Oertling, 2001:236). The typologies of pulley block find clear parallels in the mid 16th century ships *Mary Rose*, (1545) and *San Juan* (1565) (Grenier [et al], 2007; Marsden, 2009)). The origin analyses of the wood samples indicate that those have the characteristics of tropical timbers species, present in South America, with higher incidence in current Brazil. Therefore, RAVF seems to be a vessel of the early/mid 16th century, which may have been built in the Mediterranean and suffered repairs in South America, or been built in a colonial space. On another hand, the wreck orientation and the fact that the woods of the cracked hull are also from South America, may indicate that the context includes two vessels: the main ship (planked) and a support boat (cracked) which would have been built from scratch in that territory.

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