

Material Culture from the Al Hallaniyah Island early 16<sup>th</sup> century Portuguese Indiaman wreck site

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### **Abstract**

In early 1502 Vasco da Gama left Lisbon for the second time, bound to India in command of an Armada of about 20 ships. During the voyage, the group of ships stopped in different locations along the African coasts, finally sailing to India where they stayed until early 1503. Before departing back to Portugal, some of these ships remained in the Indian Ocean, charged with disrupting maritime trade between India and the Red Sea. Two of those vessels, the *Esmeralda* and the *São Pedro*, wrecked off the coast of Oman in 1503. The wreck site of one of these ships was recently discovered and excavated.

This paper presents a study of the artefacts found on that site, particularly those related to everyday life, pottery being the most abundant.

### **Introduction**

In 1998 a shipwreck site off Al Hallaniyah Island in Oman was identified. Historical documents suggest that this could be the final resting place of one of the first Portuguese ship to wreck in that part of the world (Mearns, Parham and Frohlich, 2016), belonging to the fourth Portuguese fleet to India, and the second led by Vasco da Gama. This could be the wreck site of the large nau *Esmeralda* commanded by Vicente Sodré, who died in the tragic event. It is known that *Esmeralda* and *São Pedro* were both lost in the Curia Muria islands, as the Al Hallaniyah Islands were known to the Portuguese. Sodré's squadron had left Lisbon in 1502, integrating Vasco da Gama's fleet, and sailed south towards Africa. Afterwards it sailed further south and may have reached the shores of Pernambuco (Brazil), then sailing south and passing the Cape of Good Hope and calling at Sofala, Mozambique, Kilwa and Malindi before setting sail towards India where they established contacts in Kannur, Calicute, Cochim and Coulan (Pissarra, 2001, 152-161).

Several types of artefacts were recovered during four archaeological interventions, one of the most abundant being ceramics. Although the major focus of this paper is on ceramics, all other material culture elements related to daily life on board will be taken into consideration, especially glass and some of the metal artefacts. The narrative of Sodré's voyage is only known from the famous Pêro de Ataíde letter, and the events were never clarified. After Vasco da Gama departed for Portugal, Sodré's five ships were left in the Indian Ocean to protect Cochim and disrupt the local commerce. Sodré, however, left the coasts of India and sailed to Oman, where he lost his life and two of his ships. One of the Portuguese ships left behind was the *Esmeralda*, which wrecked along the coast of Oman (Mearns, Parham and Frohlich, 2016). It is possible that the present collection may have travelled on board that ship.

Despite the profitable voyage, there was a limited amount of material found on the site. Pero de Ataíde's letter, one of the other ships' captain, mentions that the survivors salvaged as much as they could from the wreck site for six days, including silk items (Ataíde, 1503), so it is likely that all valuable items were recovered before the hull was burned. The main objective of the recovery was the guns of the ship since these are mentioned in two documents. However, in 1503, every eastern object on board that ship: either ceramics, beads, textiles or spices, was valuable. It is probable that they left behind broken or very small objects which remained on the site. The documents also record subsequent salvage activity of the site, in 1508, although once again guns are the only objects mentioned (ANTT, CC, Parte 3, Mç 3, nr 54).

The collection of artefacts found on the Al Hallaniyah site was recorded from January 19th to 28th 2016 when the author travelled to Muscat to observe and record the ceramic and other finds discovered during archaeological excavations. The collection was stored at Oman's Natural History Museum in Muscat and every object was made available for observation.

One of the first conclusions that the analysis of the entire collection permitted was that the ceramics were very consistent with an early 16<sup>th</sup> century context and that no medieval or any 17<sup>th</sup> or 18<sup>th</sup> century objects were found.

A fairly large number of sites have been associated to Portuguese 16<sup>th</sup> and 17<sup>th</sup> century shipwrecks. Nevertheless, except for a few examples, cargoes tend to be neglected as monographic studies and when studied, importance is mostly given to eastern commodities. The Aveiro A wreck from mid-15<sup>th</sup> to mid 16<sup>th</sup> century (Alves *et al.*, 1995; Carvalho and Bettencourt, 2012); the possible *Bom Jesus* (1533) wrecked off the coast of Namibia (Werz, 2015; Knabe and Noli, 2012); the *São João* (1552) and the *São Bento* (1554), both off the coast of South Africa (Maggs, 1984; Auret and Maggs, 1982); the Seychelles (Boudeuse Cay) Portuguese shipwreck, probably the *Santo Antonio* of 1589 (Blake and Green, 1986); the *Nossa Senhora dos Mártires* in the Tagus River (1606) (Afonso, 1998; Castro, 2005); the *Nossa Senhora da Luz* (Monteiro, 1999b), and the Angra wrecks in Azores (Beteencourt, 2008); the *Santíssimo Sacramento* wrecked off Bahia (Brazil) (1668) (Pernambucano de Mello, 1979; Bandeira and Gomes, 2016); the *Santo António de Tanná* in Kenya (1698) (Sansoon, 1981); and the cargo of the Sal island wreck in Cape Verde (Gomes, Casimiro and Gonçalves, 2014), are the wrecks where pottery is known to have been found

Portuguese ceramics had such global widespread that is not uncommon to find them in ships of other nationality, namely on board the late 15<sup>th</sup> or early 16<sup>th</sup> century Studland Bay wreck, in the United Kingdom (Gutierrez, 2003), the *Mary Rose* (1545) (Brown and Thomson, 2005, 464), and some of the Spanish Armada wrecks (1588) (Martin, 1979).

The ceramics found on site suggest that this ship left Portugal with a cargo which included Portuguese and some Spanish and Italian ceramics, stopped in Africa where it may have acquired some food transported inside pots, finally reaching the Indian Ocean where it acquired many other goods, either by trade or by plunder. The ceramics give information about the itinerary followed by the ship (Fig. 1).

## **Ceramics**

The Al Hallaniyah ceramics, considering the totality of objects were in fact the first material category to be analysed. A total of 1039 sherds were analysed with many different provenances (Table 1).

All the objects were given an inventory number and inserted into an Excel database. Every sherd was observed, and this analysis is based on sherd count, although some of them were recognized as belonging to the same vessel. Whenever possible the number of vessels is presented in the analysis. The majority of fragments could be identified as body sherds and although it was possible, for the majority of sherds, to understand where were they produced or what type of vessel they were not much information could be added to that. Initially an attempt to weight them by origin was tried although this will only be possible on the future when desalination is complete, and the ceramics can be dried.

Objects were considered based on their defining form characteristics, when possible, the type of rim, body, base and handles if any. Fabrics were described according to composition and colour based on the *Munsell Soil Colour Chart* (MSCC). Surface was described based on the treatment: that is, if smoothed or glazed. Finally decoration was observed and described. All the objects were photographed and the ones presenting a complete or partial profile were drawn and are presented in this paper. When two similar objects presented a complete profile, the more complete specimen was chosen for illustration.

Considering the different provenances of the artefacts this paper will present them based on their origin, that is, Portuguese, Spanish, Italian, Chinese, Iranian and African, with identifications made based on raw materials, fabrics, surface treatment and decoration. There are also some fragments that are badly burned, making it impossible to define their origin.

The ceramics in this assemblage are fragmented and eroded by action of the water. In many of the glazed wares the glaze has disappeared. Some ceramics have iron concretions attached and even though included in the counts, were not easy to recognize.

### Portuguese ceramics

The study of Portuguese ceramics from late 15<sup>th</sup> or early 16<sup>th</sup> century contexts is still in its early stages and few secure contexts have been published. These objects are mostly known in archaeological contexts from domestic activities in Lisbon or surrounding sites (Diogo and Trindade, 1998; Trindade and Diogo, 2000; Mendes and Pimenta, 2007; Cardoso and Rodrigues, 1991), Évora (Teichner, 2003) and Santarém (Boavida, Casimiro and Silva, 2014), further north in Aveiro (Barbosa, Casimiro and Manaia, 2009) or further south in Silves (Gomes and Gomes, 1996). Currently archaeological excavations are being undertaken along the Lisbon waterfront, namely in Rua do Arsenal and Campo das Cebolas which consist of early 16<sup>th</sup> century contexts identified as the land reclamation activity during the time of D. Manuel (Durão, 2012). Although unpublished the author had the opportunity to see some of these collections and the ceramics are exactly like the ones from the Al Hallaniyah assemblage.

Cooking and eating on board 16<sup>th</sup>-century ships was usually not done in ceramic vessels but in metal ones. Iron caldrons have been found in Portuguese wrecks (Gomes, Casimiro and Gonçalves, 2014) and pewter plates and cups have been recovered from many underwater sites, although most of the table wares would have been made of wood (Pernambucano de Mello, 1979; Intino, 1998). Pottery was highly breakable and was used to keep water and food, especially for the conservation of sugar and vinegar and for conserving food on long maritime voyages (Matos, 1998).

The majority of ceramics found on the Al Hallaniyah site were made in Portugal. In fact from the 1039 sherds at least 537 present a red micaceous fabric associated to shapes that are known to be produced in Portugal in early 16<sup>th</sup> century, corresponding to 52% of the entire collection. Varying from light red (2.5 YR 2/4 MSCC) to dark brown (5YR 5/4 MSCC) in colour, the sherds present a homogenous fabric with small-medium quartz, lime and micaceous inclusions. The pots were all wheel thrown showing deep rilling on the interior surfaces. Costrels to store water, cooking pots (boiling and frying pans), lids, cups, and bottles are frequent finds. Most of them present smoothed exterior surfaces and a small percentage demonstrated remains of lead glaze, especially the interior of bottles. These objects would be used in everyday activities on board.

Shapes correspond to what was being produced in late 15<sup>th</sup> or early 16<sup>th</sup> century Portugal. The objects found in this site were all produced in Lisbon, except for three sherds which were manufactured in Alentejo workshops, namely in Montemor-o-Novo and Estremoz. No evidence of northern or southern productions was found.

Similar ceramics are found frequently in Portuguese contexts or abroad. Most of the types found correspond to everyday wares mostly used to cook and store liquids. However many of these vessels have been found in terrestrial Portuguese domestic contexts and, in fact, such objects may have had different functions on board ships.

**Costrels** (cântaros) were a type of vessel whose main use was to store and serve water. Although the wall sherds of costrels and pans can sometimes be confused these seem to correspond to 227 sherds, mostly body sherds. These appear in different shapes, though the most recurrent correspond to a large vessel with flat base and globular body with a tall neck and two handles (AH1764). Although a common find on European early modern sites, one has to be aware that water evaporated quickly from inside these containers since the main purpose was to keep water fresh and semi-chilled, not for long-term storage. Evaporation could be minimized if the vessels were glazed. However, glazed ceramics are infrequent in this collection with only three objects made in Portugal presenting this evaporation solution. In spite of the long-term storage issues, unglazed water ceramics are frequent finds on board ships. A January 1502 document from the Torre do Tombo actually mentions some of the items sent on board the *Esmeralda* (ANTT, CC, Parte II, mç 5, nr 107). The document refers to the things on board most of the ships in this armada. Among many commodities, such as pitch, tallow and tar, most likely for the ship's maintenance, and honey, one of the main concerns is the storage of wine and water either in barrels (*quarteirolas para auguoa*) or *louca para auguoa* (water pottery), making it easy to understand why so many costrels were found on the wreck site. Most of the

fragments are body sherds, though it was possible to determine their shape based on rim, bottom and handle fragments, which were also found (Fig. 2 – m, n, o, p). Similar objects were found on the Studland Bay wreck site in the UK, dated to the first part of the 16<sup>th</sup> century (Gutierrez, 2003).

Water pottery, such as these costrels, is frequently found in early modern Portuguese contexts. Similar objects have been found in several contexts in Lisbon, Vila Franca de Xira (Trindade and Diogo, 2000; Mendes and Pimenta, 2007, 48) and even associated to a late 15<sup>th</sup> /early 16<sup>th</sup> century kiln site in the south bank of the river Tagus (Torres, 1990).

Among the water related ceramics there is also a **jar** that was usually used not to store but to serve water (AH1615) (Fig. 2 – u). In Portugal these were used for table service and are frequent finds in domestic collections. The Al Hallaniyah object presents only the rim though it is quite similar to objects found in Lisbon and Aveiro (Alves et al, 1998; Carvalho e Bettencourt, 2012, 737). Only eight fragments of **bottles** were recovered with globular bodies and narrow necks, three of those glazed. Such objects are not as frequent finds as unglazed ceramics though we suspect that these were used either to store water or wine.

If water was stored inside ceramic objects during the early 16<sup>th</sup> century, then water was also drunk from pottery vessels. Several fragments of ceramic water **cups** were found, one of them very complete (AH602) (Fig.2 - k). Sixty-one sherds correspond to a minimum of 49 separate vessels. Pottery cups to drink water were used in Portugal since at least the 13<sup>th</sup> century, an inheritance of the Islamic period, though the shapes changed over time. In the late Middle Age the cups present pedestal-footed bases and one has to wait until late 14<sup>th</sup> century to start observing flat based cups, which progress to shapes similar to the ones found on this wreck and similar to the ones found in Lisbon, on the Aveiro A wreck and in Santarém (Carvalho and Bettencourt, 2012, 737; Casimiro et al, in press). The cups change their form over time losing their neck and becoming more globular by the 18<sup>th</sup> century. These were widely spread through Portuguese domestic environments from all social categories and are equally found in poor and wealthy archaeological contexts and appreciated all over Europe. A foreign visitor to King D. Sebastião was taken by surprise when he saw the king drinking from one of these cups during a meal, surprised by the fact that the king was not drinking from a silver vessel (Vasconcellos, 1921, 20). The will of D. Beatriz, mother of D. Manuel, who died in 1506 and the dowry list of D. Isabel, daughter of D. Manuel and wife of Carlos V, two eminent women of nobility, mention several cups produced in many different places (Vasconcelos, 1921, 22). The cups found in this collection may have served anyone on board.

A frequent form on board is a type of **transportation jar** that was used to export goods into Northern Europe before olive jars dominated this type of form around mid-16<sup>th</sup> century (AH358) (Fig.2 – r, s, t). The flat base jar with a narrow neck and two handles is a frequent find in late 15<sup>th</sup> and early 16<sup>th</sup> century contexts in Portugal, including the Aveiro A wreck, dated from the mid-15<sup>th</sup> to the early 16<sup>th</sup> century (Alves et al, 1998; Carvalho and Bettencourt, 2012, 740;), and abroad with finds in England and the Low Countries (Newstead, 2015; Hurst, 1986; Gutierrez, 2003; Brown and Thomson, 2005, 471). Produced at least in Lisbon and Aveiro, this shape tends to disappear from mid-16<sup>th</sup> century onwards, replaced in its function by olive jars (*anforetas*

or *botijas*). Four of these objects were identified in the Al Hallaniyah assemblage. As aforementioned, early modern **olive jars** are only known to have been produced in Europe around mid-16<sup>th</sup> century. However in this collection there is a very curious shape, manufactured with Lisbon clay, which presents a pointed bottom which may indicate a first stage of production of these objects. It is impossible to know the specific function of this object. However, the thin walls, about half a centimetre thick, reveal that it was probably used to store liquids (Fig. 3 – x).

**Cooking pots** (*panelas/tachos*) can be divided into boiling or frying vessels (Fig.3 a-s) and seem to correspond to 177 sherds. The ones used to boil have flat bases and globular bodies with vertical handles and semicircular rims (Fig. 3 a-f). No horizontal handles were identified and this contributes to the chronological evaluation of the site since these are very rare before the 17<sup>th</sup> century, and actually only known in the Ria de Aveiro A wreck (Carvalho and Bettencourt, 2012, 739). **Frying pans** (*frigideiras*) are wider, shallower forms with or without handles. When handles are present they have different morphologies with the most frequent being wide concave handles, similar to the ones found in costrels or round ones (AH1900, AH1692). Handle evolution in this type of object is curious and in the late 15<sup>th</sup> or early 16<sup>th</sup> centuries they present a round shape (as the ones found on this site) by the mid-17<sup>th</sup> century these handles will be triangular (Fig 3 a). Such objects were largely used in cooking activities as stated in the 15<sup>th</sup>/16<sup>th</sup> century *Livro de Cozinha da Infanta D. Beatriz*, one of the oldest cookbooks in Portugal (Gomes, 1996). Wider pots, some of them carinated, offer robust handles with oval section (Fig. 3 g). Although the general designation for these objects are cooking pots or kitchen wares it is possible that many of them were not used to cook but to serve or transport and store food such as sweets, marmalade, butter or even the honey mentioned in the cargo manifest, working as jars. However, since some of the people on board could transport their own kitchen ware the overall potential functionality of the vessels must be discussed.

The aforementioned cargo manifest in the Torre do Tombo archive (ANTT, CC, Parte II, mç 5, nr 107) should be analysed thoroughly. Although the *Esmeralda* list is very limited relating to food items, the same document states that other ships took butter and jams that had to be stored inside pottery containers. The same food was clearly on board the *Esmeralda*.

All of these storage and cooking pots would be covered by pottery **lids** which are largely represented in this collection with their trunco-conical shape, flat base and central knob (Fig.4). These objects are some of the most frequent in medieval and post-medieval archaeological contexts in Portugal, especially due to their frequent use (Mendes and Pimenta, 2007, 30) but also in places outside Portugal where Portuguese redwares have been found, namely in the United Kingdom (Newstead, 2015), or on board the Great Armada ships (Martin, 1979).

**Bowls** are a frequent find with 49 sherds corresponding to a minimum of 42 vessels. These are basically from two different types: hemispherical with semicircular rims and slightly trunco-conical with a very low ring foot (Fig.2 a-f). Although both have semicircular rims the hemispherical ones are thicker while the others are thinner. Both are widely known in 15<sup>th</sup> through 16<sup>th</sup> century contexts with similar examples in the Aveiro A

wreck (Carvalho and Bettencourt, 2012; Alves et al, 1998) but also in similar-chronology land contexts in Aveiro (Barbosa, Casimiro and Manaia, 2007), Vila Franca de Xira (Mendes and Pimenta, 2007) and even in Lisbon in early 16<sup>th</sup> century waterfront contexts. These vessels most likely served as containers that were exported to several parts of the globe with 16<sup>th</sup> century examples found in England (Gutierrez, 2007).

There are two fragments that should be taken into consideration. One fragment corresponds to a bowl decorated with small quartz stones on its outer walls, usually associated with Estremoz productions (AH1698), via a description made by Duarte Nunes de Leão in an early 17<sup>th</sup> century posthumous publication (Vasconcellos, 1921, 31). However, recent investigation based on the analysis of fabrics suggests that these cups, decorated with small stones, were also produced in Lisbon and Coimbra, as a clear imitation of Estremoz ware (Newstead and Casimiro, in press). These ceramics were famous all around Europe, especially in the second half of the 16<sup>th</sup> century, though they are already mentioned in 1507 will of D. Manuel's mother, which documented her leaving 36 cups (*apedrados*) to a convent in Beja (Freire, 1914, 91). The date suggests that these were already in use in the late 15<sup>th</sup> century. They appear in late 15<sup>th</sup> or early 16<sup>th</sup> century archaeological excavations in the Lisbon area and were recognized in Vila Franca de Xira and Lisbon (Mendes and Pimenta, 2007).

One single sherd of Montemor-o-Novo, distinguishable by its fabric with large quantities of small white quartz stones was also found on board (AH1696). Though difficult to attribute to a specific form, due to its inclination it is probably a jar or some other vessel to store water. Montemor-o-Novo ceramics are known to be produced since the medieval period, although one has to reach the early 16<sup>th</sup> century to actually have a full documentary reference to specific objects. Once again in D. Beatriz' will (1507) she leaves 39 Montemor *púcaros* (cups) to a convent in Beja (Freire, 1914, 91). In the dowry of D. Isabel, daughter of D. Manuel and wife of Carlos V, Montemor ceramics are present with 17 cups, and two large jars/costrels (Gomes and Casimiro, 2015, 138).

Although milk pans or large flared bowls are among the most frequent finds in Early Modern Portuguese domestic environments, no such objects were found on the Al Hallaniyah site. These were large vessels that possibly could not have found any use onboard.

### Spanish

Some 37 sherds correspond to objects produced in Seville or Andalusia workshops. These are mostly unglazed and 21 of those fragments can be identified as **water costrels**: once again supporting the theory that the majority of ceramics on board had that functionality. Fabrics are pale yellow and sandy; a characteristic of southern Spanish productions (7.5YR 8/2 MSCC). Decorated Spanish objects are not frequent in this collection. One bowl handle offers a floral decoration (Fig. 5 - e), a very frequent solution in these type of objects, and a lid also shows floral decoration (Fig. 5 - i).

Three **plates** reveal remains of white tin glaze (AH1394, AH1595, and AH1422) (Fig.5 – a, b, c). Two of them present a recessed bottom and semicircular rim, while the third only has a portion of the rim decorated with

small circles or dots around it (Fig. 5 – f). These tin glazed objects are found in archaeological contexts at least since the late 15<sup>th</sup> century and mainly in the first half of the 16<sup>th</sup> century. Similar objects have been found in many archaeological sites, including underwater sites (Gutierrez, 2003). Such artefacts were also produced in Portugal, imitating the Spanish forms, however that production is only archaeologically supported from the 1520s onwards (Ferreira, et al, 2013; Ferreira et al, 2015; Casimiro, 2013; Torres, 1990), although it may have occurred earlier. However, the finds from Oman are Spanish based on fabrics observation which can be described as having a light buff or yellowish tone. In the early 16<sup>th</sup> century and considering that Portugal was probably not yet producing such items, they would not be that frequent on Portuguese tables, except on wealthy ones. These were not the everyday eating objects on poor people's tables and one has to realize that one of the plates, the bowl and the lid are, in fact, decorated.

Similar objects have been found in late 15<sup>th</sup> and early 16<sup>th</sup> century contexts in Vila Franca de Xira (Mendes and Pimenta, 2007) and Silves (Gomes and Gomes, 1996). These are also frequent finds in the early 16<sup>th</sup> century Lisbon waterfront / reclamation sites mentioned previously.

These objects were constantly imported into Portugal since their early production stages. The trade between southern Andalusia and Lisbon is documented since the Islamic period and continues through at least the 16<sup>th</sup> century with ceramics originating in Seville, Malaga, Valencia and Talavera (Brandão, 1990).

No lusterware decoration was recognized in this collection though it is not possible to know if it was decorating some of the finds since the glaze did not survive on most of them.

Andalusian ceramics, the majority produced in Seville, have been identified in early colonial contexts at least since the late 1490s and it is assumed that such ceramics travelled for the first time to the New World on board Columbus' fleet (Deagan, 1987, 56). They appear in colonial contexts in the very early stages and endure until late 16<sup>th</sup> century (Lister and Lister, 1982, 48).

The rim fragment of one trunco-conical plate with a recessed bottom and yellow-brownish glaze with manganese decoration was found. These *melado* productions are known to have been made in Seville and are constant presences in early 16<sup>th</sup> century contexts in the Iberian Peninsula and in the first New World Spanish colonies (Deagan, 1987, 48) but also in the Portuguese North African settlement of Qsar es-Seghir (Redman *et al*, 1979) (Fig. 5 – d).

Spanish ceramics were very frequent in Portuguese late 15<sup>th</sup> century or early 17<sup>th</sup> century contexts, essentially as water ceramics or table ware and are found by the hundreds in archaeological collections. In this sense it is not difficult to conclude how these objects travelled on board the Portuguese fleet, although it is impossible to infer who used them.

### Italian

The fragment of a *albarello* or cylindrical drug jar with semicircular rim, slightly carinated close to the neck, seems to be the remains of the only Italian object found in this site (AH1163) (Fig.5-j). The evidence of green glaze by the rim and the paste colour and quality, which is light pale yellow, seems to indicate a Montelupo

production (Berti, 2001) quite frequent in Portugal from 1450 to 1550 (Casimiro and Barros, 2013; Amaro et al., 2013; Rodrigues et al., 2012). In fact it will be the introduction of large quantities of porcelain that made these coloured European ceramics go out of fashion. This is the reason why hundreds of these objects are found associated with 1510-1550 waste pits or land fillings since Lisbon inhabitants were replacing them with the new blue on white ceramics (Casimiro, Boavida and Moço, in press).

### Chinese and Southeast Asian Ceramics

Oriental ceramics found on site were essentially produced in China, Thailand, Burma/Myanmar, with just a few examples believed to be made in Vietnam. The trade of Chinese ceramics in the Indic is widely known and in the 16<sup>th</sup> and 17<sup>th</sup> centuries this type of ceramics was being used all over India and the Middle East. Chinese merchant vessels are not known to travel as far as India coasts in the late 15<sup>th</sup> or early 16<sup>th</sup> century (Flecker, 2015, 21) and most of the ceramic trade in this period is believed to have been made by Muslims who would acquire these commodities in ports such as Tenasserim working as distribution platforms between China and the Indian ocean (Gutman, 2002, 110).

Although Chinese ceramics are not very numerous on the site, possibly related to the salvage of everything valuable on board, these are very consistent with the date of the site's formation. They are consistent to what is usually attributed to Hongzhi porcelain produced between 1488 and 1505. There are not many terrestrial sites with appropriate materials to date these objects. However, museum dated artefacts as well as some wrecks from this period, especially the ones that have not been plundered, hold crucial information for the identification of these ceramics. The Lena Shoal junk, wrecked in the Philippines (Goddio *et al.*, 2002), the Brunei wreck (Pirazzoli-t'Serstevens, 2011) and the Penny's point wreck (Lam, 1989-1992) can shed some light on some of the ceramics found on Al Hallaniyah since they all sank close to the time of the 4<sup>th</sup> India Armada. The majority of the oriental finds, as expected, can be identified as stoneware and the forms are essentially storage vases, although celadons, porcelain and even some earthenwares were also identified (Figs 6, 7 and 8).

Six vessels were identified as **blue on white porcelain**: three bowls (AH1742; AH1414; AH1800), two plates (AH1558; AH1624) and one small cosmetic box (AH1257), although the lid is missing. They all present floral decoration in a very Chinese style with "florid and dense designs that fill up the entire surface of the vessel, echoing the foreign-inspired Yuan tradition" (Pirazzoli-t'Serstevens, 2011, 12). The smaller bowls are decorated with blossom branches and the plates with the typical Hongzhi chrysanthemum and the classic role on the rim. The small box is an equal match to a box found on the Lena Shoal junk. It presents a circular shape with rounded sides and a flat base. The decoration consists of branches (Goddio et al., 2002, 121). One of the plates has remains of a Chinese character or letter although too fragmented to identify. Such decorative designs were also found in the Lena Shoal junk cargo (Goddio et al., 2002, 151, 153). Despite the smaller number of objects, they seem to correspond to export ceramic types, that is, they were not made to

be consumed inside Chinese territory and were exported to India or the Middle East. However, one has to bear in mind that similar ceramics may have been consumed in China as domestic wares.

The majority of the **storage vases** (187 sherds) present a dark brown or black exterior glaze in the upper part of their body and are similar to artefacts made in Thailand at this time, possibly in the Maenam Noi kilns in the Singburi province. The fabrics present a light gray tone (2.5Y 7/2) MSCC). Similar Thai jars were largely found in Hongzhi wrecks namely in the Lena Shoal and the Brunei wreck (Goddio, et al., 2002, 227; Pirazzoli-t'Serstevens, 2011, 7). These present light grey fabrics and their shapes vary between tall elongated objects and globular ones with very small handles and short necks (Fig.6 – b, h). The rims vary between semicircular and square with a flat upper surface. The other **martaban** storage jars (51 sherds) (Fig.6 – a), present brownish and dark green glazes, with beige or dark grey fabrics and were made in southern Burma (Borell, 2014, 257). Most of them do not present any decoration except for some concentrically incised lines on the bodies' upper part. Three sherds, belonging to the same pot, show remains of incised decoration with petals, with remains of an olive green glaze, suggesting it may be a Vietnamese production (Goddio, *et al.*, 2002, 224). These objects, although having utilitarian uses, also shared a symbolic importance within eastern households. This function was lost once they reached Portuguese contexts where they were used as containers for prestige goods thereby gaining another symbolic meaning for their users (Simões, 2012).

Although all the jars found in the wreck site are broken, and a few had lost their black glaze, it was possible to reconstruct their shapes (Fig. 6 – h). These are known as transportation vases and were used to store water, wine and food items but also spices and other commodities (Borell, 2014, 268). Abundant pepper grains were found on the site and could have been transported inside such jars, though the presence of coconuts may also indicate other ways of transportation. Coconuts associated with pepper were found in the *Nossa Senhora dos Mártires* (Magalhães, 1998, 121). The novelty and value of these storage jars made them desirable in European contexts so they occasionally appear in archaeological contexts in Lisbon contexts from the 16<sup>th</sup> or 17<sup>th</sup> centuries (Ferreira, 2015; Simões, 2012), or on board the *Nossa Senhora dos Mártires*, which sunk when approaching Lisbon (Coelho, 2008). These are difficult objects to date based on their style since there were very similar objects in the 14<sup>th</sup>-16<sup>th</sup> centuries and were often reused.

One of the frequent finds in these wrecks are **small Chinese jars** covered with white or pale glaze, usually transported inside larger jars. In the Al Hallaniyah context only two of these objects were found. Similar finds were recovered in the Lena Shoal and in the Brunei wreck and usually have the same shapes of the larger vessels (Fig. 11), possibly to store fine liquids.

Ten **celadon** objects were also recovered corresponding to nine plates and one jar rim with colour and decoration suggesting they were produced in the province of Zhejiang, in the Longquan kilns (Fig. 8). They offer the same characteristics as other Middle Ming period productions with light grey fabrics, fine grain and dense structure, making the objects quite heavy (Crick, 2010; Goddio et al., 2002, 88). These present a variation of light and dark green glazes and the decoration is similar to petals, made with some incisions under the glaze, creating shaded areas around the plate ledges and on the rims. After five centuries

underwater they have lost their shine, and in one of the objects even the glaze is starting to disappear. These vessels were clearly made as export items and possibly consumed in the Near East, South-East Asia or India where they were believed to have special characteristics: namely the identification of poison since it was believed that such objects changed colours in contact with poisonous substances (Goddio et al, 2002, 87). Celadon plates and jars are rare in Portugal and in Lisbon just a few fragments have been found in early 16<sup>th</sup> century contexts (Vieira, 2010).

**Storage vases** were also found with unglazed dark and light pink fabrics (Fig. 6 – k, l, m). They resemble the vases produced in the 15<sup>th</sup> and 16<sup>th</sup> century manufactured in Mae Nam Noi kilns, in Burma, although may have had other sources. These large vessels have flat bases, globular bodies and pointed rims with several sizes and diameters. Occasionally they have remains of green glaze on their outer surface though was most likely due to the proximity of glazed objects inside the kiln (Brown, 1988, 43).

A pot with a light buff fabric, bottle shaped, was decorated with incised geometric decoration seems to be an example of Thai earthenware (Fig. 9 m). These objects are not very frequent in publications and the only known example was found in the Lena Shoal wreck, so consistent with the main collection from the Al Hallaniyah wreck (Goddio *et al*, 2002, 230).

There are seventy eight sherds that can be classified as oriental. Most of the stonewares correspond to storage jars while the earthenwares seem to have the shape of cooking pots (Fig. 9). The production centres of these pots were not determined though the paste is quite similar to Thai productions.

Most of these storage vases were probably brought on board by plundering. The letter that Pero d'Ataíde wrote to D. Manuel mentioned several ships with all sorts of commodities and food items that were sacked (Ataíde, 1504).

### Indian productions

Late Medieval and Early Modern Indian ceramics are among the less published objects from archaeological excavations with just a few reports that can actually help in their identification. The Oman site offered some sherds that could be considered Indian productions, although their fragmentation does not allow the identification of specific shapes. They present light pinkish fabrics and were probably made to be used as cooking pots, though their function on board is debatable. Considerable amounts of these ceramics have been found in Pattanam excavations (Cherian and Menon, 2014, 56), quite close to where we know that the Portuguese Armada interacted with local communities. A few sherds of a very reddish pottery can also be associated to Indian productions, though once again very fragmented. These have a similar colour to some local Indian productions and were probably produced there (Perryman, 2000).

### Iranian

Blue glazed objects, usually designated as Turquoise Blue Glaze, correspond to 56 sherds and about 20 vessels, mostly plates and bowls (Fig. 7 – i, j, k, l; Fig. 9 – k, l, n). These have a light yellowish fabric, although

some of the sherds present a pinkish or light reddish colour (10R 5/3 MSCC). This could be reflecting a different production area, adding to the different tones of blue in the glaze. Visually this seems to correspond to the frequent alkaline glazes used in Irian glazed wares, although no archaeometric analysis were yet performed. These are normally attributed to Persian (Iranian) workshops whose potters dominated the technique from early medieval period onwards. Although such ceramics are rarely published, especially when found in archaeological contexts, there is some information suggesting that these blue glazed ceramics were also produced in the Oman area or even in India (Power, 2015). The forms correspond to plates, bowls and pots with small handles. These were frequent exports to the Indian continent. Recent excavations in Pattanam, an archaeological site located on the Malabar Coast between Calicut and Cochin which was occupied from Antiquity until the present day have revealed large amounts of these ceramics in Late Medieval and Early Modern contexts (Cherian and Menon, 2014, 56)

It is difficult to state where these ceramics were taken on board the *Esmeralda*, if along the Malabar Coast or by plundering a vessel that had obtained them from Iranian workshops. Such ceramics were traded across the Indian Ocean passing through the Philippines and all the way to Japan so it was quite easy to acquire them (Priestman, 2016).

### African

African ceramics are still mostly unknown from the wreck's time period and most of what it is known is based on ethnographic studies. However, African historical archaeology of the places where the Portuguese passed or established is slowly starting in Cape Verde, Angola and Mozambique. Forty-two sherds in the assemblage were similar to productions from the above regions and correspond to bag shaped items, decorated with basket type elements (Fig.10). The fabrics are very variable usually quite heterogeneous and with large inclusions. Their colour varies from a very dark brown to light reddish. These were all handmade and fired in an open fire. It is still a very difficult pottery type to date and even to recognize where it was made, however recent archaeological excavations in Cape Verde where African populations from all parts of that continent were taken, before being departed as slaves, reveal similar ceramics (Sorensen, Evans and Casimiro, 2012), although it is still not possible to attribute them to a specific production area. Similar ceramics were also found in the archaeological excavations of Mbanza Congo in the Kongo Kingdom where Portuguese ceramics were also found, demonstrating the contacts between these groups (Clist et al, 2015). One of the pots found in the Al Hallaniyah site corresponds to a bag shaped globular vase with basket type decoration near the neck. Similar objects have been found in Sofala (Mozambique), although specific chronologies are difficult to define (Madime, 2015, 77).

Although such sherds correspond to more or less 4% of the overall collection they are still representative of the itinerary that the Armada ships took and the fact they stopped along some African shores.

### **Other finds**

Ceramics are the most frequent item found in the assemblage, however other categories of objects were also found in this wreck site that should not be ignored, since they are important for characterizing the outbound journey from Portugal to India.

Glass objects are scarce and only 10 fragments were found, most of them belonging to bottles and flasks. Everted rims are the majority of fragments which vary from white to light green in colour. The type of rim, body, base and handles were also considered as well as the colour of the material; none of the objects presented decoration. Glass was being produced in Lisbon in the early modern period and these bottles are comparable in shape and colour to the ones found in Lisbon (Medici, 2005), making us believe that all the vessels were on board when leaving Lisbon. It is difficult to know what their functionality was on board though they could have served at the captain's table or as receptacle for medicine. Glass is frequent in Portuguese wrecks and although rarely properly published it was found at least in the *Bom Jesus*, or in the cargo of the wreck in Sal Island, Cape Verde (Gomes, Casimiro and Gonçalves, 2014).

Although many other metal objects were found on site, in the main focus of this paper is on the ones that could have some relation to the daily life activities on board so we did not consider any military devices such as the guns or the cannon breeches or navigational devices, among other things. In this sense we were interested in the buckles, spoons and any metal vessels that could have been used to store, cook or serve food. One of the most abundant objects, although quite fragmented, are pewter vessels with several plate fragments as well as parts of jars and mugs recovered. Once again these were a frequent item on board many ships, including Portuguese ships. They were found in the *Bom Jesus* (Knabe and Noli, 2012, 185) and the *Nossa Senhora dos Martires* (Intino, 1998). These and not ceramics were in fact the daily objects used to eat and drink if not by everyone on board, at least by the crew since these would be part of the ship's general table service, highly reusable and difficult to destroy. Pewter vessels maintain their shapes from the 15<sup>th</sup> to the 19<sup>th</sup> centuries. Copper, brass or iron objects used in daily activities are also frequently found in many Portuguese wrecks such as the cooking pots in the *Bom Jesus* (Knabe and Noli, 2012, 181) or the iron caldrons in Cape Verde (Gomes, Casimiro and Gonçalves, 2014).

However other metal objects were found on board, one of the most interesting being a collection of eight spoons made from a copper alloy (Fig.12). Although these were daily objects in use in Early Modern Portugal, metal spoons are quite rare in Portuguese terrestrial archaeological contexts and the known objects were mostly made of wood, transforming the Al Hallaniyah set into a very interesting discovery. A silver spoon was found on the *Nossa Senhora dos Martires* excavation (Intino, 1998, 220) and two were recovered in the Hospital Real de Todos-os-Santos excavation, in Lisbon, all from 17<sup>th</sup> century contexts (Bargão, 2015, 308; Boavida, in press). Metal spoons should have been used at the table of officials while crew certainly used wooden objects, the same reality recognized in other European wrecks (Vlierman, 1997,165).

Other metal finds should be taken into consideration in this paper that were not directly used to prepare or consume food but were used on a daily basis. That is the case of the three buckles found on site, all produced with a copper alloy (Fig. 13). Buckles are found with different sizes and shapes on archaeological sites and

can be associated with different functions. The ones found on this site are quite small and possibly used to fix belts. Two of them present a round shape with a single loop, and in both cases the tongue has survived, while a third shows a double-looped symmetrical square frame with central strap bar. Buckles do not change shape significantly over time and similar objects have been identified in 15<sup>th</sup> and 16<sup>th</sup> century contexts with similar shapes (Whitehead, 1996, 13). Regularly found in Portuguese wrecks similar objects were found in the *Bom Jesus* excavations (Knabe and Noli, 2012, 191) but also in later ships such as in a Cape Verde wreck (Gomes, Casimiro and Gonçalves, 2014, 10) and in the *Santo António de Tanná* (Teixeira and Gil, 2012, 675). Manillas, or copper/brass rings, are among the regular finds on board Portuguese ships, especially the ones which sailed and stopped along African shores. These have been found, for example, associated to the *Bom Jesus* (Knabe and Noli, 2012, 181) or associated to the cargo of a Portuguese wreck in Cape Verde (Gomes, Casimiro and Gonçalves, 2014, 10). Their function was essentially to be traded for slaves. The *Livro de Armação do Navio de Santa Maria da Conceição* (1522) describes the presence of many of these objects among the cargo to be traded for slaves and ivory in Africa (Mota, 1970, 27). This was there a very important type of cargo on board trading ships destined to acquire slaves or other goods from Africa. As far as we know the manillas on board the *Esmeralda* may have been changed for food supplies in any African settlement and the artefact found in the Al Hallaniyah excavation may represent that trade.

Measuring sets are widely found in Portuguese wrecks so we imagine that they were present in every ship that was involved in any kind of trading. King D. Manuel I was responsible for a reformation of the weights and measures in Portugal in the first years of his reign and although we do not have specific information about how that was made. In 1499 sets of copper measures were already being produced and distributed in every village and city, and possibly ship, and used until the 19<sup>th</sup> century (Lopes, 2003, 149; 163). A complete set was found on the *Bom Jesus* excavation (Knabe and Noli, 2012, 189) and in the *Nossa Senhora dos Mártires* (Intino, 1998, 224). Some of the measure cups were found on board some ships of the Great Armada and two of them were found on this site.

## **Discussion**

An overview of the material culture found in the excavation was the purpose of this paper. Ceramics are the most abundant material type category and the collection, with all types of objects, can be generally dated between 1498 and 1510. The first date is established based on the presence of Portuguese ceramics which could not have reached the Indian Ocean before 1498, when Vasco da Gama discovered the maritime route to India. The ending date is calculated based on the Chinese porcelain found on site, which could not have been produced after 1510 based on their characteristics which relate them to Hongzhi productions. The Hongzhi reign ended in 1505, however, it is possible that the kilns did not change their style immediately and these could have taken a few years, or that the pottery could have circulated for some years.

Taking into account to all the type of ceramics found on site and the similarity of these ceramics with late 15<sup>th</sup> and early 16<sup>th</sup> century productions either in Portugal, Spain or in China and other production centres it

is our belief that they may have originated from the Portuguese ship that wrecked there in 1503. No other 16<sup>th</sup>, 17<sup>th</sup> or even 18<sup>th</sup> century ceramics were found on site. Even Portuguese and Spanish ceramics could not be dated after 1550 based on their morphological attributes. In ceramics studies absences are as important as presences and the fact that no later coarse wares, red moulded wares or Portuguese faience were found suggests that this site was not visited by Portuguese ships in the second half of the 16<sup>th</sup> century or later centuries. On the other hand, Chinese porcelain was one of the major ceramics consumed in the Indian Ocean and no Zhengde or Jiajing or even later porcelain was found on site.

The type of ceramics found and their breakage is consistent with the disaster story. If this ship was salvaged, and believing in Pero de Ataíde testimony that surviving sailors collected a large variety of materials, including silk and rice pots, it makes sense that just a few items were left behind. Among the uninteresting things would be broken pottery or very small items that were just lost at the bottom of the sea such as spoons or buckles. The most valuable objects found on site, such as two little complete pots, beads and coins, may have not been seen at all. On the other hand one should not forget that water dynamics over more than five hundred years could have been responsible for the highly fragmented finds.

Research into the use and importance of ceramics on board Portuguese Indiamen, as well as other ships crossing the oceans is still in its very early stages. When a wreck is identified importance is given mostly to the structure of the ship and guns. If large amounts of pottery are found on board these are studied as cargo and only a commercial importance is discussed, especially if it includes Chinese ceramics. This wreck site permits a study into the role of ceramics in everyday life and their importance in storing and eating. Similar efforts were made in the study of the *Mary Rose* material culture (Gardiner and Allen, 2005), but never for a Portuguese 16<sup>th</sup> century wreck. The combination of archaeological and documentary information for this site permits us to conclude that the most important type of ceramics on board were water related, especially used in storing water. The cargo manifest produced in 1502 in Lisbon clearly mentions this concern and refers a few times to *louca da agoa* (water ware), thus it is not difficult to conclude why costrels are the most abundant shape. Cooking pots, possibly used as storage jars, are the second largest category although it is our belief that they were used mostly as containers for sweets and butter, as part of the food used to feed the people inside the ship. Cooking was mostly made on metal vessels. No soot marks were found on these pottery sherds reinforcing this statement.

Based on this collection it is safe to conclude that just a few ceramics were used in the daily service of eating and drinking: activities which would be mostly fulfilled by metal and wood objects. Pottery was mostly used as containers for water and food. Spanish and some Portuguese ceramics may have been used at the table of officials as higher status objects. However, and believing that this is the resting place of the *Esmeralda*, the collection has to be analysed carefully, especially because it was a ship during the first years of the India adventure and the pots acquired, either by trade or plunder, in the Indian Ocean, were all exotic vessels and had more value than just their storage functionality. They were very valuable on their own and probably possible to sell in Portugal, if the ship ever returned. This changes in the later 16<sup>th</sup> century when these vases

become more frequent due to increased trading activity and since their ability to conserve water and food was better than the Portuguese ceramics meaning they were commonly used on ships travelling to India. Although a thorough study of ceramics is still needed for the *Bom Jesus*, at least two martaban jars were travelling on board, possibly storing water, since it evaporated less through fabric of these jars. According to the description of Pyrard de Laval in his early 17<sup>th</sup> century voyages in South Asia refers that water was stored inside this containers (Borell, 2014, 268).

Chinese ceramics, especially porcelain, had a huge market in Lisbon, especially in this early period. In the very early 16<sup>th</sup> century they would be exclusively used by the royal family and very wealthy nobility or religious orders. This must have continued until the 1530s when the amount of porcelain increases in Portugal. In 1522, in the first year of his reign, King D. João III signed a document manifesting that a third of the cargo of every ship returning from India could be porcelain, among other objects, revealing just how important this commodity was for Portuguese society and the great profit it brought to the crown and India merchants (Intino, 1992, 63). Such amounts can be confirmed in the cargos of the *São João* and *São Bento* wrecks. This generalized consumption of Chinese ceramics in Portugal increases when Portugal is allowed to establish a colony in Macau. At this point everyone with a medium income and above in Portugal could actually acquire porcelain through several stores in Lisbon and it was consumed in large quantities in palaces and convents and houses all over the country (Henriques, 2012; Gomes, Gomes and Casimiro, 2015; Casimiro and Santos, 2014). Portugal thus becomes one of the largest consumers of porcelain in Europe, importing the vessels on a large scale until the early 17<sup>th</sup> century when the Dutch and English established trade routes to the Indian Ocean.

The *Esmeralda* cargo did not have Portuguese and Chinese ceramics exclusively. A few sherds of African pots were also found and believed to have been acquired during the trip to India, when they stopped in Africa to get water and food. The same can be said about the ceramics produced in India. What we miss is the way these ceramics were acquired. If Portuguese, Spanish and Italian pots were put on board in Lisbon, and if African ceramics were acquired on the outbound trip, Oriental pottery could have been either bought with food or plundered from the several ships that Vicente Sodré attacked during the voyage.

Other objects related to the daily life on board were also found and despite the fact they do not permit as many interpretations as pottery they were also used by Portuguese sailors. Glass bottles could have stored medicine, of fundamental importance on a journey to India. Metal objects made either of pewter or copper alloys were also a daily commodity in sailors lives and were used in basic activities such as eating, drinking, cooking or support someone's belt.

## **Conclusion**

Based on the information retrieved by the ceramics and other material culture items found on board one can state that these objects reflect the itinerary of Vicente Sodré's lost ships in 1502/1503. Leaving Lisbon it was loaded with objects essential for the storage of water and food and just a few items used to serve as table

ware such as plates, bowls and cups. In the few stops that the fleet made along the African shores, several African vessels were brought on board possibly with food. When reaching India the ships, either by buying or plunder acquired large quantities of eastern wares from Iran, India, Thailand and China, among other possible places that were acquired and serving as containers and as objects with an intrinsic value, due to their exotic production origins. These objects were quite rare in Portugal and worth a lot of money so profit was always on the mind of the ship's captains.

On the other hand this collection allows some conclusions to be drawn about life on board. Even that pewter objects are the most frequent in such activities some of these ceramics may have been related to water and food consumption. A few cups used to drink water reveal that daily habits were firmly entrenched for some of the sailors on board and the practice of drinking water using a clay pot, so common in Portuguese terrestrial households was not forgotten in this nautical household sailing so far from Portugal. A few plates and bowls could have been used at the table, although it is always difficult to safely define uses for ceramics on board ships. What could have been used as a cooking pot in early 16<sup>th</sup> century Lisbon could be just a container on board these ships on their way to India since cooking was most likely made inside metal objects. It is always difficult to pinpoint the specific use of objects when found in contexts related to early exploration and trade. The men aboard these ships would have been faced with a variety of immense challenges, which likely made their use of familiar material culture, like the European ceramics and metals found in this assemblage, as well as the incorporation of unfamiliar material culture, such as the martaban jars, a varied and difficult to interpret process.

This archaeological context, believed to be formed in 1503 reveals some of the first contacts between Europe and the East. Objects produced in Europe, Africa and China, in different places, where used by the same people simultaneously, becoming some of the first testimonies of a global trade involving different type of commodities and people that was just starting.

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