# Red Slip Wares

## A SPATIAL STUDY OF LATE ROMAN FINE WARES IN THE MEDITERRANEAN COASTAL AREAS AND EUROPE

Lizanne Mollema

Image source
Museum of Fine Arts, Boston (https://www.mfa.org/collections/object/african-red-slip-ware-bowl-with-orpheus-and-the-animals-155324)

# Red Slip Wares

## A Spatial Study of Late Roman Fine Wares in the Mediterranean Coastal Areas and Europe

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# 1. Introduction

During the Late Roman Period, there were hundreds, if not thousands of small local pottery production centers spread throughout the Roman Empire (Lewit 2011). They provided the tableware used every day by the Empire's inhabitants: cups, plates, bowls, dishes. Some production centers, however, grew much larger and came to supply not only the local population, but a far wider audience, their products being used all across the Empire. Red Slip Wares originate from some of these production centers and were the most popular Late Roman fine wares. They have been found everywhere, from big cities to small inland villages, and from Cabinteely (Ireland) and Tamuda (Morocco) to Adulis (Eritrea) and Tanais (Russia)[1] (Bes 2015; Hayes 1972; Kaptijn 2009; Kelly 2010).

Production probably started around the beginning of the 1st century AD with the start of the production of Sagalassos Red Slip Ware (Van der Enden *et al* 2014). Shortly after, northern Africa began producing its African Red Slip Ware (Bes 2015, 8; Hayes 1972, 387). The Cypriot, Egyptian and Phocaean Red Slip Wares joined the collection a few centuries later. Production continued in most cases until the 7th century, except for Cypriot and Egyptian Red Slip Wares which were produced into the 8th and possibly even 9th century (Bes 2015, 8; Commito 2014, 132).

*Figure 0.2. African Red Slip Ware plate with a scene featuring the sacrifice of Isaac by Abraham. Source: Museum of Fine Arts, Boston (www.mfa.org).*

Red Slip Wares have been gathering academic interest ever since the first sherds were found in the 19th century, probably due to the use of appliqué decoration or stamps on several later variants, mostly dating from the 4th to the 6th century (Hayes 1972, 3, 217). These decorations would frequently features Christian symbols like crosses and biblical scenes[2]. An example can be seen in figure 1.2.

## 1.1 Aims

Currently, there are several volumes mapping the Red Slip Wares in a smaller area, with the largest publication (to my knowledge) being that of Philip Bes, who mapped Italian and Eastern *sigillata* as well as African, Cypriot and Phocaean Red Slip Wares (Bes 2015). Other examples include Paul Reynolds for the western Mediterranean, Charles Thomas for the UK and Ireland, and Piroska Hárshegyi and Katalin Ottományi for the ancient Roman province of Pannonia,

[1] Figure 1.1 in Appendix A shows all sites mentioned throughout this thesis for which location has not otherwise been shown.

[2] For a comprehensive overview of appliqué motives used on African Red Slip Wares, see Armstrong 1993.

which includes Hungary, Croatia and eastern Austria (Hárshegyi and Ottományi 2013; Reynolds 1995, Thomas 1976). These studies are all concerned with a specific area, and study other Roman wares as well as Red Slip Wares. However, with the exception of Hayes' original maps from his 1972 book, there has not yet been an attempt to map Red Slip Ware finds across the entire Roman Empire, and none of the maps mentioned above include distributions for vessel form and/or decoration (Hayes 1972).

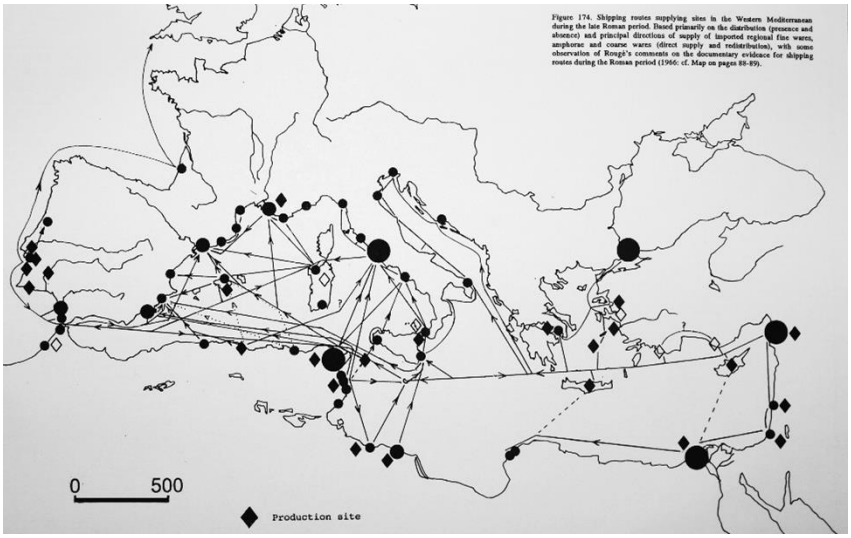


*Figure 1.3. Maritime supply routes in the western Mediterranean during the Late Roman period. Source: Reynolds 1995, 451.*

Looking at Red Slip Wares across the entire Roman Empire would bring some benefits over just researching at a small area. Apart from just being able to see whether or not a ware was exported somewhere, it is possible to look at differences in export between vessel forms and decoration categories. In addition, it can be researched whether these differences stay the same or differ depending on the time period. Any differences will be able to shed light on changing economic relationships between the heart of the Roman Empire, its provinces and other areas outside the Empire. In addition, trade in the Roman Empire was highly interconnected with foodstuffs and other products being traded across the entire Mediterranean (Reynolds 1995, 122-127). Figure 1.3 shows some of the maritime trade networks, and although it mostly focuses on the western Mediterranan shipping routes from east to west are also visible. Since the Roman economy took place on this large scale, it only makes sense to research aspects of it on the same scale.

To answer some of the questions above, this thesis will work with the following research question: **What was the spatial distribution of Red Slip Wares in the Roman Empire?**

In addition to the main research question, there are three subquestions:

- **How do different time periods affect Red Slip Ware distribution patterns?**
- **What is the spatial distribution of different Red Slip Ware vessel forms?**
- **What influence do vessel form and time period have on the appearance of Red Slip Ware decoration?**

First, there will be a short background on the origins of Red Slip Wares, followed by a brief summary of general trends for all Red Slip Wares. Subsequently each of the five types, African, Cypriot, Egyptian, Phocaean and Sagalassos Red Slip Ware and their development will be described. Following that, the gathered data will be presented, with different chapters for general data, pottery type (African Red Slip Ware, Cypriot Red Slip Ware, etc), date, vessel form and decoration. After that the data will be discussed and compared to the literature where available. Lastly, the results of this thesis will be summarized in the conclusion.

## 1.2 Definition of terms

For the purposes of this thesis, all five wares will be referred to with a geographical location: African, Cypriot, Egyptian, Phocaean or Sagalassos Red Slip Ware. This is done for continuity in the text so the names of all wares follow the same format. Even though, as will be explained later, the terms Cypriot and Egyptian Red Slip Ware might not adequately describe the origins of these wares. All dates mentioned are in AD, unless specified otherwise.

The term Late Roman is usually used to refer to a period between the mid or late-3$^{rd}$ century to the mid-7$^{th}$ century AD (Stathakopoulos 2017). In this thesis, the term will be extended to mean the 1$^{st}$-8$^{th}$ century AD.

## 1.3 Methodology

This work builds on the work published in Bes 2015, who made an overview of eastern Mediterranean *terra sigillata* and Red Slip Ware finds (Bes 2015). For use in this thesis, a Microsoft Access database was created. Selected data from the database is presented in Appendix B. At the start, this database consisted of a single table (named "1-Main Table"). Other tables were added later and are not used to record data, but only show queried data from the Main Table. The following values are recorded in the Main Table:

- A unique identification number.
- The pottery type: African, Cypriot, Egyptian, Phocaean or Sagalassos Red Slip Ware.
- The amount of sherds and vessels
- The period the sherds date to, in centuries AD. In case a sherd could be dated to multiple centuries -for example it dates from 350 to 425 AD- both centuries were recorded. Early finds were recorded as 1$^{st}$ century or before, late finds as 8$^{th}$ century or later.
- The name of the location where the sherds were found, usually the name of either a modern or an ancient town.
- The location's coordinates, recorded in latitude/longitude using a DD°MM'SS.S" notation. In case a coordinate was located in the Western Hemisphere, a negative longtitude value was recorded.
- The vessel form: shallow bowl, deep bowl, dish, flat-based dish, closed form, lid or plate.
- Whether or not the sherd(s) featured any decoration (a yes/no field)

- How many sherds featured a particular type of decoration, subdivided into geometrical, religious/mythical, floral/botanical, animal/human, or no decoration. The field No Decoration was only used to note where it was recorded that there was no decoration present on a sherd, if decoration was not mentioned all of the decoration fields were left blank. Because the lack of decoration on a sherd does not necessarily have to mean that there was no decoration on the original vessel, for example a rim sherd of a form where floor decoration was used, this field cannot be used for statistical purposes.
  If a sherd contained multiple decoration categories, for example an animal figure surrounded by botanical motives, only one of these was recorded to avoid there being multiple values recorded for one sherd. The method used to decide which of the categories to record was a personal decision, based on an estimate made in advance of which category would be rarer. This order was, from low expected frequency to high: geometrical, botanical/floral, animal/human and religious/mythical decoration. So in the case of the previous example, the sherd would be recorded in the category animal/human. Rouletting and grooves were not counted as decoration, except in Sagalassos Red Slip Ware where they were counted as geometric decoration if they were used extensively.
- The literary source where the sherd information was published. Recorded as 'author plus year of publication', a separate text document contains the full reference.
- Any comments, including information on Hayes forms and decoration types (Hayes 1972).

The results were exported to the Open Source program QGIS, where maps could be constructed (*qgis.org*). The source of the used maps is *www.naturalearthdata.com*, for all maps the resolution 1:10m was used. The following maps were used in this thesis: 'Natural Earth II with Shaded Relief, Water, and Drainages'; 'Lakes + Reservoirs'; 'Rivers + lake centerlines' and 'Rivers + lake centerlines: Europe supplement'.

Insets showing the location of detailed maps in chapter 2 were obtained using Google Maps. In case no source is mentioned for tables or maps, they were created using data from various sources collected in the database. Sources for individual data points can be found in the database, using the link in Appendix B.

## 1.4 Data

To obtain the data, internet search results were utilized as well as cross references. A result of this is that most sources used were (relatively) small articles that were available online, as well as predominantly more recently published sources. These articles would often only contain summarized information, which leads to gaps in the available information. The same, however, was applicable to books: Bes' table of find points, although very extensive, only contained the find place, date and amount of the sherds, not other information like Hayes form, vessel form or decoration (Bes 2015; Hayes 1972).

Hayes' 1972 book, which was also used, had a different problem: many of his records originate from museums or were otherwise removed from their location a long time ago, leading to uncertainty about their origin (Hayes 1972). These records were not used for the purpose of this thesis. In addition, they only provide a selection of sherds found at a site rather than complete assemblages. This leads to disproportionally high number of data points on the maps with only one or two recorded sherds.

Reynolds' overview of western Mediterranean finds only very rarely mentions decoration, even when the amount and forms of the sherds would lead to expected decorated pieces (Reynolds 1995). The main sources used are visualized in figure 1.4 (Appendix A).

Other restrictions on the data collection were time, and language. Academic paper are still frequently published in languages other than English, and although it was possible to find some foreign publications mentioning Red Slip Wares (see the chapter Reference for examples), there must be numerous other sources available that were not found. These most likely include Spanish, Portuguese, Italian, Turkish and Russian publications, among others, for their respective countries. For example, numerous Russian-language publications with regard to Red Slip Wares are mentioned in an English-language article by Zhuralev (Zhuralev 2002).

# 2. Theoretical background

## 2.1 Before Red Slip Wares

Before Red Slip Wares started to emerge on the markets of the Roman Empire, another kind of red pottery was the dominant type. This is the well-known *terra sigillata*, or Samian Ware, which featured a distinctive red-brown gloss (Hayes 1972, 9). Red gloss pottery first appeared in the eastern part of the Mediterranean, with some early examples from the 2nd century BC known at Pergamon. There, they replaced black-glazed Hellenistic vessels. Red gloss pottery gradually spread throughout the eastern Mediterranean, but only started to replace black glazed wares in Italy in the 1st century BC. Italy started to produce its own red gloss wares around 30 BC (Van Oyen 2015). A few years later production sites were set up across Southern Gaul, spreading to Central Gaul a few decades later. In the 2nd and 3rd centuries AD production had spread further across the western part of the Empire, and Gaul as well Spain would continue to produce *terra sigillata* pottery long after Italy had ceased its production (Hayes 1972, 11-12; Van Oyen 2015).


*Figure 2.1. Some production centers of South Gaulish Wares. Source: Lewit 2013, 229.*

After the start of *terra sigillata* production in Italy, Arretium quickly emerged as the main producer (Fülle 1997). These Arretine Wares would quickly grow out to be the pottery standard across the Roman Empire (Hayes 1972, 9). Two different types of terra sigillata were produced in Arretium: relief decorated and plain. The decorated vessels were designed by artists and highly popular throughout the Mediterranean. As a result, several other pottery production centers soon started to imitate it by using the vessel forms, decorations and its characteristic use of the potter's name stamps.

Arretine pottery stayed the dominant pottery type until about 60 AD, when many of the decorated vessel forms were replaced by new plain vessel forms. Stamped decoration was replaced by appliqué. Soon after, Arretine Ware lost its dominant place in the market and was replaced by wares from other Italian workshops, in addition to South Gaulish wares. These started as a derivative of Arretine wares but quickly developed their own decoration style. South Gaulish decorated wares, like their earlier Arretine counterparts, quickly became very popular across the Mediterranean and stayed that way until the early 2nd century, when they all but disappeared from the Mediterranean coastal areas (Bes 2015, 72; Hayes 1972, 11). Spain also started to produce its own terra sigillata during that time, which stayed in use until the 4th century (Hayes 1972, 11). This might have limited the presence of other, imported Mediterranean wares until that time. Gaulish workshops continued to produce fine wares after

production of *terra sigillata* ceased, exporting to the Rhineland, Britain, Spain and Central Europe (Lewit 2013). But in the south and the east, several varieties modeled after North African wares became popular instead: Red Slip Wares.

## 2.2 Red Slip Wares

The Red Slip Wares are all characterized by their use of a red slip covering a red body clay, with the slip usually being one shade darker than the body (Hayes 1972). Vessels look similar to terra sigillata, but the fabric often has a lighter color, is courser, and the slip does not have a glossy surface like terra sigillata does (Hayes 1972, 13).

Red Slip Wares can be subdivided into several different types, all with different production areas. African Red Slip Ware (ARSW) was produced throughout northern Africa, mostly in Tunisia (Mackensen and Schneider 2002). Egyptian Red Slip Ware (ERSW) was produced in several sites in southern and central Egypt, and Phocaean Red Slip Ware in workshops in the west of Asia Minor, modern-day Turkey (Bes 2015; Tomber and Williams 1996). In contrast, only a single production center each for Sagalassos and Cypriot Red Slip Ware is known so far, in both cases consisting of a cluster of several production sites close together (Jackson *et al* 2012; Willet and Poblome 2015). The development of all Red Slip Wares is broadly similar, although African and Saglassos Red Slip Ware started production a few centuries before the other types. All mirror broader developments in the Roman World, with production peaks in the early 5$^{th}$ and 6$^{th}$ century during a short-lived increase in wealth in the eastern part of the Roman Empire (McCormick 2002, 60-63).

Although African, Cypriot and Phocaean Red Slip Ware all saw a peak in production at the end of the 6$^{th}$ century, most of the Red Slip Wares disappeared in the course of the 7$^{th}$ century (Bes 2015, 130). This was most likely due to a decrease in demand as a result of falling population levels, and the people that were left switched to more local wares (Arthur 2008, 164). The 6$^{th}$ century peak is something that mostly took place in the eastern part of the Empire. In the northern and western parts, there was a rapid decline in imported pottery after Roman troops withdrew from the area, population levels dwindled and towns were deserted (Arthur 2008, 164).

Other areas of the Empire were not immune, but decline was not visible there until the 7$^{th}$ century. Declining population levels and prosperity in the east were thought to have been the result of Arab conquests starting in the mid-7$^{th}$ century, but it appears that decline had already set in before that and that it was not greatly affected by the change in rule (Liebeschuetz 2015, 256-287). Instead, the cause for decline is likely much more complex. A major contributor would have been the Justinian Plague, which broke out in 541 and just two years later had already spread across the Mediterranean and deeper into the continent (Little 2007). In the next two decades it would continue to break out approximately every ten years before finally

disappearing in the mid-8th century. The plague caused "massive mortality", leading to numerous social, economic and military problems as result of the shortage of manpower (Little 2007, 115-116). Other factors in the east might include Persian conquests and a series of earthquakes, all happening in the second half of the 6th century (Liebeschuetz 2015, 256-287). In the northern part of the Empire, many cities around the Danube had become abandoned around 600 following more than two centuries of raids by several tribes from the northeast (Liebeschuetz 2015, 423-464).

Whatever the cause, in many areas some of the wheel-made forms were replaced by hand-made vessels, although wheel-made pottery continued to be produced (Arthur 2008, 166). This trend was already visible in the 3rd century in the more remote northern parts of the Empire and gradually spread throughout the Mediterranean.

Red Slip Wares were very commonplace throughout the Empire, showing up everywhere from big cities to small inland villages (Kaptijn 2009). It is therefore probably not surprising that local producers attempted to imitate them. This has been attested for numerous types of Red Slip Wares, with imitations being manufactured in Italy and Syria, among others (Arthur 2008; Vokaer 2013).

## 2.3 African Red Slip Ware

African Red Slip Ware (ARSW) is sometimes also known as Late Roman A and B pottery, *terra sigillata chiara* and *terra sigillata africana* (Baklouti *et al* 2014; Hayes 1972, 13). It was not produced in a single center, but in towns throughout northern Africa, from the 1st to the 7th century AD (Fermo *et al* 2008, 151). Most pottery workshops are known from Tunisia, examples include El Mahrine, Sidi Marzouk Tounsi, Henchir es Srira, Sidi Khalifa, Sidi Saad, Djilma, Oudhna and others (Mackensen and Schneider 2002). In Algeria, the only recognized example is Tiddis (Bonifay 2013, 531). Several Tunisian production sites are shown in image 2.1. But imitations were produced outside of Africa as well: for example, several pottery workshops in southern Italy are known to have produced ARSW imitations, although for a limited amount of time between the late 4th and early 6th centuries AD (Arthur 2008, 162).

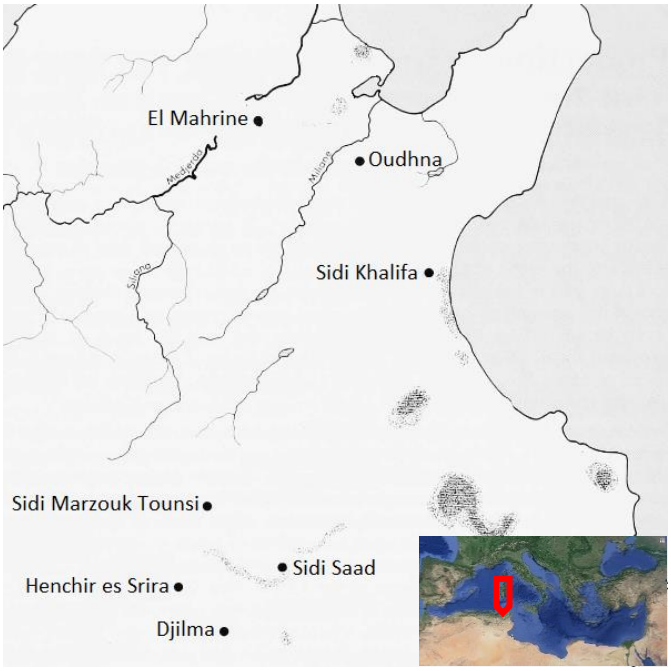



*Figure 2.2. Several African Red Slip Ware manufacturing sites in Tunisia. Source: after Mackensen and Schneider 2002, 122.*

## Development

Before the 4th century, African Red Slip is thought to have been mostly exported to the western Mediterranean, with eastern finds in this period being rare (Bes 2015, 134). Both production and exports expanded in the 4th century, with the increase especially visible in the eastern Mediterranean (Bes 2015, 6). Because although some ARSW already made its way to the east, it was not until the 4th century that finds in that area increased (Vokaer 2013, 574). Exports expanded until ARSW was the most commonly used fine ware in the Mediterranean, with the exception of the northwestern parts of the empire which continued to use the Gaulish terra sigillata-type vessels (Hayes 1972, 13). It would remain that way for centuries. Like the Arretine wares before it, ARSW became the leading type after which other pottery styles were modeled. The production of ARSW ceased in the 7th century, with possible reasons for this already discussed in the previous paragraph.

## Appearance

The color of ARSW is mostly orange-red to brick-red (Hayes 1972, 13). Impurities are usually lime, fine quartz in various shades of white to black, and small quantities of mica. The slip is one or two shades darker than the clay body, made from the same clay. Depending on the thickness of the slip application the vessel can appear matt, in the case of a thin layer, or smooth and slightly shiny, in the case of a thicker layer although it is only very rarely as glossy as terra sigillata.

Until the 2nd century -when terra sigillata production all but disappeared- vessel forms resembled those of terra sigillata (Hayes 1972, 15). After that, ARSW invented its own vessel forms, often replacing them with completely new forms.

ARSW vessel forms are fairly standard, staying practically the same for up to a century in most cases when they are succeeded by new forms (Hayes 1972, 14). The fact that vessel forms have relatively frequent, drastic changes makes them useful for dating purposes. The wares produced in the African Red Slip style were mostly bowls and dishes (McCormick 2002, 53). Decorations are usually limited, mostly incised or stamped, sometimes relief-modeled (Hayes 1972, 14). Most vessels, however, were decorated with only simple grooves or rouletting, or had no decoration at all. Stamp designs included geometric patterns, human figures, animals, botanical images and cross-monograms.

The Italian imitations mentioned earlier can be distinguished from “regular” ARSW because they were of a lesser quality than the original: coarser, thicker, and often with a mottled appearance due to the uneven application of the slip (Arthur 2008, 162).

## 2.4 Cypriot Red Slip Ware

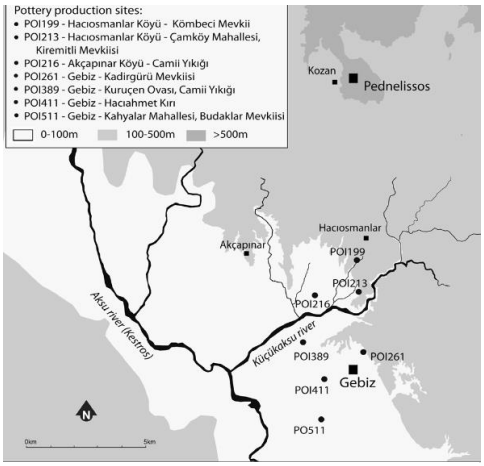



*Figure 2.3. Production sites near Gebiz, Turkey. Source: Jackson* et al *2012, 93.*

Cypriot Red Slip Ware (CRSW) is also known as Late Roman D Ware (Hayes 1972, 371). It was named for the abundance of fragments encountered in sites on Cyprus, although no production sites had been found there (Jackson *et al* 2012). A production site has now been identified near Gebiz, a town in the south of modern-day Turkey. It is possible that Gebiz was only one of multiple production centers, but it is so far the only one that has been identified as such (Commito 2014, 128-132). The production of CRSW started in the late 4th century, and continued until at least the late 7th century, although, as mentioned before, its production possibly continued until the 8th or even 9th century AD. The fabric of the kilns remained remarkably similar during its entire production time, apart from a brief dip in quality in the mid-6th century (Hayes 1972, 371). Distribution was fairly limited, rarely being found in areas with longitudes to the west of Egypt (Bes 2015, 137)

### Appearance

Due to the simple kilns used at the site, both the quality and color of the pottery that is produced varies considerably (Jackson *et al* 2012). The fabric is usually very fine, smooth, and contains only the occasional lumps of lime (Hayes 1972, 371). The colors range from almost yellow, to orange, brown, red, maroon, even pinkish or purple. The maroon variety appears to be the most common, together with the pinkish variety. The vessels were most likely stacked on top of each other in the kiln, leading to blackened or creamy rims instead of the usual red tones. Like in ARSW, the slip is dull when applied in the thin layer but shiny if applied more thickly, and in the latter it is also a shade darker than the body clay.

The body structure is not as fine as that of most of the other Red Slip Wares, vessel walls are generally rather thick (Hayes 1972, 372). Vessel forms are also less standardized, with a muddled distinction between them. Decoration mostly consists in the form of rouletting, similar to ARSW. Sometimes stamped decorations can be found on the floors of dishes. Cross monograms appear to be a popular stamp choice although other designs are also used.

## 2.5 Egyptian Red Slip Ware

According to Hayes 1972, there were three main styles of Egyptian Red Slip Ware (ERSW) (Hayes 1972, 387). He called them imitations of ARSW, with production of ERSW only starting when the former became popular in the region: the late 4th century AD, which, as previously mentioned, was a time when ARSW exports expanded to the eastern part of the Mediterranean.

The first type, type A, is thought to have been produced near Aswan and type B in multiple workshops across Middle Egypt (Tomber and Williams 1996). The production area of the third type is currently still unknown, it may not even have been manufactured in Egypt (Hayes 1972, 399). Type B was mostly used locally, type A is popular in Egypt and Nubia and type C was exported throughout the eastern Mediterranean.

### Appearance

The fabric of ERSW type A is very similar to that of ARSW, with a pinkish or orange-red color and a thin matt slip of a slightly darker shade than the body clay (Hayes 1972, 387). The rims are often discolored in a similar manner to CRSW, with colors turning cream or purplish. What makes ERSW of a lesser quality than ARSW is the many impurities it contains. It contains quartz, mica, and other indeterminate red and black particles, with end products weighing less compared to their ARSW counterparts. However, levigation of the clay, harder firing and burnishing can make the product comparable to some of the poorer quality ARSW vessels.

Type B features vessels with much thicker walls, and thicker layers of slip (Hayes 1972, 397). Most likely due to uneven firing, vessels frequently have an orange-red surface but the cores of the walls are a purplish-red color.

Type C is orange or brown in color, with a thick slip and impurities of grits, lime, quartz and occasionally some mica (Hayes 1972, 399). Sometimes the wall cores are greyish. Where all other types of Red Slip Wares started to disappear in the 7$^{th}$ century, ERSW type C only started to emerge after 600 AD. Production may have continued into the 8$^{th}$ century.

ERSW types A and B have several vessel forms that are recognizable as being copies of late 4$^{th}$ to 7$^{th}$ century ARSW vessel forms (Hayes 1972, 387-401). Type C also features several forms modeled on ARSW, but only of 7$^{th}$ century forms. All three types have decoration similar to other types of Red Slip Wares, featuring rouletting and stamps.

## 2.6 Phocaean Red Slip Ware

Phocaean Red Slip Ware (PRSW) is also known as Late Roman C (McCormick 2002, 60). A production site has been found in Phocaea, which was thought to be the only production site until others were discovered in the same area (Empereur and Picon 1986). More production areas have been discovered since then, with PRSW manufacture attested in towns like Cyme, Myrina, Gryneion, Çandarlı, Velia, Ephesos and Sardis (Bes 2015, Empereur and Picon 1986). Phocaea is,

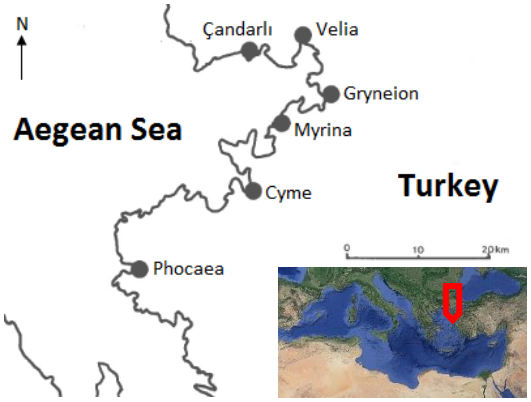



*Figure 2.4. Several PRSW production sites. Source: after Empereur and Picon 1986, 144.*

however, still seen as the main source of exported wares, the others catering more for local needs.

### Development

PRSW was very common in the eastern Mediterranean and the Black Sea areas (Arthur 2008, 162). It was, for example, the most common fine ware in Syria from the late 5th to mid-7th century (Vokaer 2013). Its production started later than some of the other types, in the 4th century AD (Grey 2014). Before producing PRSW, nearby Çandarlı was a production site for the eponymous Çandarlı Ware, also a type of red gloss ware though more similar to terra sigillata than the red slip wares (Hayes 1972, 316). Çandarlı Ware continued to be produced until the late 3rd century AD, perhaps even early 4th century, during which time it rivaled ARSW in popularity. The surface finish and manufacturing technique of Çandarlı Ware was very similar to that of Phocaean Ware, and Çandarlı Ware form 4 and PRSW form 1 were almost identical (Schrunk 1984, 356). It is plausible that the region shifted from producing Çandarlı Ware to PRSW after the popularity of terra sigillata ended and that of Red Slip Wares took over.

### Appearance

Like the other types, PRSW is a red fired clay, with a red slip covering the ex- and interior, fusing with the clay's body (Hayes 1972, 323-324). But where ARSW had quite a coarse grain, that of PRSW was much finer. Impurities are similar, mostly lime, although mica was rarer and quartz is absent. The color is different, too, brownish or purplish red or maroon. The slip, like that of ARSW, is a refined version of the body clay and is dull because it is usually only applied very thinly. The different color indicates a higher firing temperature than the other African Slip Wares. The color is mostly uniform, although like CRSW and ERSW the rim is often discolored from partial reduction.

Decorations are also similar to ARSW, with rouletting and with stamps featuring geometric, floral, animal, human and cross monogram designs (Hayes 1972, 324).

## 2.7 Sagalassos Red Slip Ware

Sagalassos Red Slip Ware (SRSW) is a relatively new addition to the list of Red Slip Wares, first being published in the mid-1990s (Poblome 1999). The fabric is red, completely slipped and smooth (Poblome 1999, 27). There are no inclusions besides the occasional piece of white limestone in some of the larger vessels. SRSW is named after its production center, Sagalassos, located in modern-day Turkey (Willet and Poblome 2015, 874). The production took place a little to the east of the town, starting in the early 1st century AD, possibly even late 1st century BC and continued until the 7th century (Van der Enden *et al* 2014; Poblome *et al* 2002). Sagalassos is located about 70 km from Gebiz which, as previously mentioned, was a major production site of Cypriot Red Slip Ware.

The town experienced a period of prosperity in the 4th and first half of the 5th century (Commito 2014, 288). After that time, the town's population shrunk until in the 7th century it resembled a small village, perhaps a result of the Justinian Plague. Shortly after, in the mid-7th century, the town was hit by an earthquake which caused severe damage to the former city's buildings, and the town was all but abandoned. Most of the population moved to nearby Ağlasun (not displayed on figure 1.1 due to the large scale), but there is evidence of the region continuing to produce pottery (Commito 2014, 295; Poblome 1999, 23). Most of these were course kitchen wares but a production site at Bağsaray (not displayed on figure 1.1 due to the large scale), 20 km southwest from Sagalassos, continued to produce a red slipped ware similar to CRSW which, as mentioned before, had its production center not far from Sagalassos.

Sagalassos does not look like the typical place to have a major export center. It had no access to any navigable waterways and even the nearest major road, the *Via Sebaste*, did not pass the town directly but ran a little further out in its territory (Willet and Poblome, 2015). In that respect, it is similar to the production sites for South Gaulish Wares which were also located inland (Lewit 2012). With regard to local distribution, at least in the first three centuries AD, almost all of the tableware in and around Sagalassos belonged to SRSW, and after that time other wares were still not very common (Willet and Poblome, 2015). It has been estimated that only one quarter of the center's production output was meant for use in Sagalassos and its territory, with the remainder being exported to other parts of Pisidia, the region where Sagalassos is located, and the rest of the Roman Empire.

The author who first published SRSW now argues that it should not be classified as its own separate ware but instead should be grouped with CRSW and several other small regional wares. This because major similarities between the two forms exists, including in fabric and vessel forms (Poblome and Firat 2011). The fact that the production centers of SRSW and CRSW are located very close to each other adds credibility to this argument. Especially considering that the other Red Slip Wares were also manufactured throughout a larger region, rather than in a single production center. There is no reason why this could not be true for SRSW and CRSW, and that any differences between the two might simply be the result of regional variation.

# 3. General data

## 3.1 Introductory remarks

In the following chapters (chapters 3-7), the results of the gathered data will be presented.

It should be noted that caution is advised when trying to say something meaningful about the absence of materials in certain places: the fact that no results were recorded for that area in this thesis does not necessarily mean that no material was or will be found there. Yet the author will endeavor to make some remarks in regard to absence of materials, partly on the basis of studied literature which indicated an absence of the materials on certain sites, and partly on the basis of other data being available for that site but a specific category being absent.

In addition, something which is worth repeating is the lack of available information regarding certain aspects which were being recorded in the database, but were not mentioned in the original source. As a result, maps for decoration and vessel form (dish, plate, etc) have a proportionally smaller amount of data points than maps for dates and wares (ARSW, CRSW, etc). Because there are only nine recorded sherds from one site, ERSW will not be discussed in any of the following chapters. Its data is incorporated only into tables 3.1 and 3.2, but will be visible in the relevant maps. SRSW will only be limitedly discussed.

## 3.2 General data

A total of 20287 sherds and vessels were recorded, spread out over 283 sites. Figure 3.1 (Appendix A) shows the data on a map, visualizing the amount of sherds per site. This map shows the total of all wares on each site, the data has not been separated by pottery type. Figure 3.1 shows the wide spread of Late Roman fine wares: fragments can be found even beyond the borders of the Roman Empire, as evidenced by finds in modern-day Eritrea, Ireland, and the Netherlands north of the Rhine (Bes 2015, Hayes 1972, Kelly 2010). In general, most of the sites are located either along the coast or close to rivers. Just a few examples of the latter include Orléans (France), Stobi (Macedonia) and Vienna (Austria) (Bes 2015, Hárshegyi and Ottományi 2013, Hayes 1972). A more detailed view of this map with rivers highlighted can be seen in figure 3.2 (Appendix A). A major exception to the water proximity rule is inland Tunisia, where a cluster of ARSW production centers are located 50-150 kms from the Mediterranean (Peacock *et al* 1990).

The amount of sherds and vessels per ware can be seen in table 3.1 (next page). ARSW is immediately visible as the most common of the Red Slip Wares, but the difference between CRSW, PRSW and SRSW is not as pronounced as would be expected given that CRSW and especially SRSW are considered local wares with a limited distribution. This distortion can be ascribed to the intensive excavations and collection of sherds at Sagalassos, its production

*Table 3.1. Total amount of sherds per ware.*

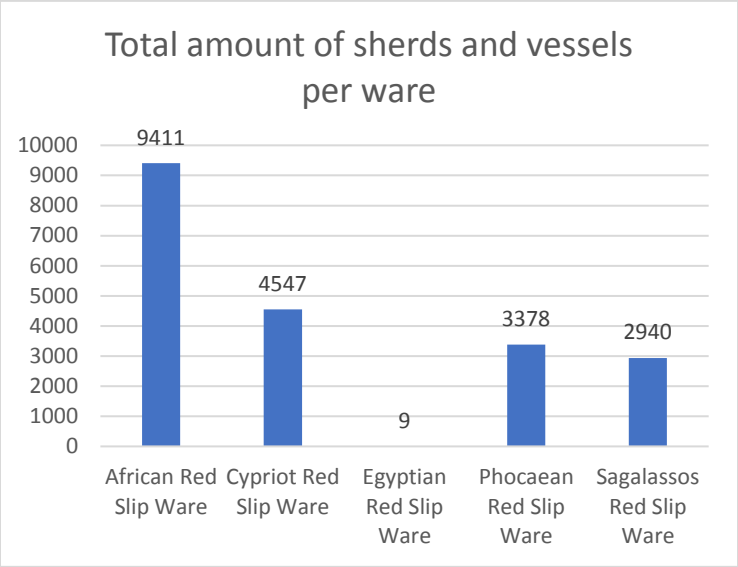
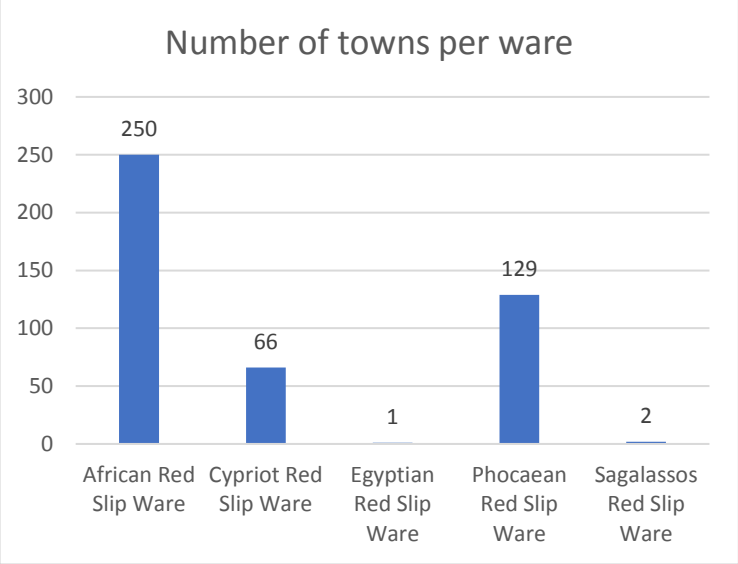



*Table 3.2. Number of towns per ware.*




center (Poblome 1999). A similar case applies to CRSW, where 73% of sherds originated from three production sites located within a few kilometers of each other (Jackson *et al* 2012).

As a result, an analysis of the amount of towns where each ware was found would be more helpful and the results here are closer to what would be expected. They can be seen in table 3.2. ARSW is found on by far the most sites - showing up in almost 90% of the sites recorded in this survey - followed by PRSW, and then CRSW. Only two sites with SRSW have been recorded in this thesis, which is not surprising following its status as a ware in "splendid isolation" (Poblome and Firat 2011, 49).

# 4. Pottery type

This chapter will be concerned with the data regarding the spatial distribution of the different pottery types. Because ERSW and SRSW were only recorded for one and two sites respectively, they will not be discussed in this chapter. They are, however, shown in figure 4.1[3] for completeness. Figure 4.1 shows the different pottery types, their deposit size and their popularity in relation to the other Red Slip Wares. In places where there were multiple pottery types found on a single site, the percentages are shown in a pie chart. Sites which only featured a single pottery type are represented by a simple circle, with the circle size increasing with deposit size.

## 4.1 ARSW

ARSW is, by far, the most wide-spread of the Red Slip Wares. The difference is not immediately noticeable in range -PRSW can be found in many of the same areas- but mostly in numbers, with a steady presence in areas across the Empire. Because where the other wares are mostly focused in the eastern part of the Mediterranean, ARSW is also popular in the west. This is very likely the result of the location of its production centers. Because the other wares are produced in the east, but ARSW has its production center almost right in the middle of the Mediterranean. This gives it the perfect opportunity to export its wares across the Roman Empire, including the west, where there is a gap left by the other Red Slip Wares. Although there are, of course, in the western Mediterranean the South Gaulish and Hispanic *terra sigillata* producers, among others, supplying fine wares to the population.

When looking at Red Slip Wares, ARSW has a virtual monopoly in northern Africa: only in Egypt and in eastern Libya are other Red Slip Wares present, and even then ARSW still provides around half of the Red Slip Wares. Aside from being popular from east to west, ARSW also occupies the two vertical outliers: being found on the island of Iona, Scotland, beyond the Empire's Britsh frontiers, as well as along the Red Sea coast down to the Horn of Africa (Bes 2015; Hayes 1972, 422). ARSW gets transported further inland than most of the other Red Slip Wares, although there is a major gap in the data for the entire northwestern corner of the continent. However, Hárshegyi and Ottományi's study into Late Roman pottery imports in the inland Danube area makes no mention of any Red Slip Wares other than ARSW (Hárshegyi and Ottományi 2013). If PRSW has not been found there, it is unlikely that it will be found further away.

Barring a few exceptions, in most sites east of central Greece ARSW is outnumbered by its counterparts from Asia Minor. A curious exception is the coastal areas in the northeastern corner of the Mediterranean, including the northern tip of Cyprus, where ARSW once again represents a majority of the Red Slip Wares. It is unclear what the reason is for this sudden

[3] Figures 4.1-4.4 can be found in Appendix A.

increase in sherds. Because it is not just in percentages, but the absolute number of vessels in the northeastern corner of the Mediterranean is quite high as well (figure 4.2). Perhaps the many shiploads of cargo coming through the port city of Antioch are the cause of this relatively high number of finds. Antioch was an important economic center during the Late Roman Period, and the third largest city in the Empire after Rome and Alexandria (Vorderstrasse 2004, 114). As a result, high numbers of pottery remnants are to be expected, and it is logical that a percentage of the wares imported into the city and traded within the city limits made its way to other towns and villages in the area.

## 4.2 PRSW

Figure 4.1 shows several interesting trends with regard to PRSW. One of these trends is that there appears to be a simple rule: the further away to the west one gets of Phocaea, the lower the percentage of PRSW gets. That this also extends to absolute numbers can be seen in figure 4.3 . The number of finds per site tends to be relatively low in the western part of the Mediterranean, with higher numbers only recorded in the Iberian peninsula. Although the number of finds in the sites on Sardinia and Sicily (both recorded as single sherds) might be higher than represented here: both have Hayes 1972 as source, which only mentions single vessels and does not deal with the assemblage of entire sites (Hayes 1972). But the data from other sources, which do look at the full assemblages, show similar results. In general, PRSW is not often found west of Greece. And in Greece, too, finds appear to be largely limited to the east coast.

But although finds in the western Mediterranean are scattered, the same is not true of the British Isles: they feature a relatively high occurrence of sites containing PRSW pottery. The PRSW finds in the Western Mediterranean show that, although scare, PRSW was present in that area. In Spain and Portugal, a relatively high number of sherds and vessels was discovered, which could mean that PRSW was relatively frequently transported through the Gibraltar Strait and along the Atlantic coast towards Britain and Ireland. Transport in this direction might have been more common than to other parts of the Western Mediterranean: for example, no PRSW sherds were recorded in the western half of northern Africa.

Another corner of the Empire, but one that was for PRSW traders probably easier to reach, was the Black Sea region. And although ARSW was also present in the northeast, PRSW was much more common (Zhuralev 2002, 265). The location of Phocaea, close to the Bosporus, would have allowed sea traders from the area easy access to the Black Sea region, much easier than any for of the other Red Slip Wares, and as a result its appearance there is not surprising.

But in general, in the east, the PRSW trend that further means less is not as noticeable. It is possible that the relatively low percentage of PRSW finds in central Asia Minor means that in the east the ware was traded by sea as opposed to over land, making it able to bypass this part

of Turkey for the most part and instead end up further away, where it is again frequently found in Cyprus, riverside towns in Syria and in Israel and Palestine. Perhaps more data from central Turkey would help create a clearer picture here, because although there appear to be more finds in Syria than in southeastern Turkey the amount of recorded sites is too low to definitively conclude anything. But if sea trade was the main method of exporting PRSW, its small numbers in Egypt are quite surprising. It appears to have encountered some major competition there in the form of ARSW and CRSW. It is possible that PRSW came, at least in the most eastern part of the Mediterranean, as part of a larger shipment with other goods. Ships usually carried more than one type of goods, with fine wares often being only secondary cargo (Reynolds 1995, 126-128). They might have been transported alongside goods like oil, wine, and cereals. Egypt might simply not have had a need for the type of wares Phocaean ships, or others carrying PRSW as cargo, provided or it preferred getting them from other sources for a variety of reasons.

## 4.3 CRSW

Even more so than PRSW, CRSW finds are limited to the eastern Mediterranean. The only areas where they can be found in any high numbers is their production area in south-central Asia Minor and in Cyprus, Israel and Palestine (figure 4.4). The only two sites in this dataset where CRSW is found west of Greece is Bracara Augusta, Portugal, with two sherds, and Valencia, Spain, with seven sherds (Quaresma and Morais 2012; Reynolds 1995). Since the distribution areas for PRSW and CRSW overlap in the east, it is conceivable that a few sherds of CRSW traveled with shipments carrying PRSW or other goods.

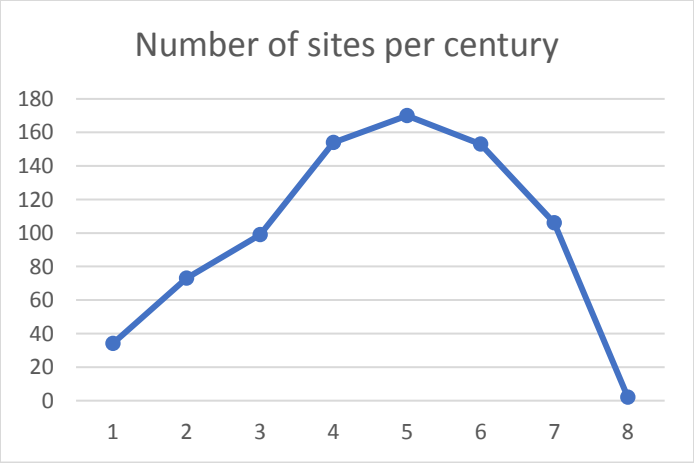
It is not hard to see why this ware was originally named Cypriot: it is in effect the only place where CRSW consistently represents a majority of the sherds. A similar case could be made for a few Israeli and Palestinian sites, but the datasets of most of these sites only represent very few sherds and could represent a biased sample. There are, however, three sites for which a relatively high number of Red Slip Ware sherds was recorded: Caesarea Maritima, where 68 CRSW represents 68 sherds out of a total of 135 Red Slip Ware sherds, Jalame (126/205) and ‘En Boqeq (260/560) (Bes 2015). In all three, CRSW sherds present roughly 50% of the assemblage, which adds credibility to the relative popularity of CRSW in the area.

## 5. Date

It is important to mention at the start of this chapter that, because most vessels cannot be ascribed to a single century, finds are often counted twice and the same site will, for example, appear in tables and on maps for both the 5th and 6th century. An exception to this is the 7th century: the majority of 7th century finds are dated to only the 7th century, due to the way data was presented by Bes (Bes 2015). This needs to be taken in account when observing a drop in finds between the 6th and 7th century. This aforementioned bias of double value does not apply to tables and images dealing with the number of sites, because multiple centuries listed means that it was highly likely that the site was active during the entire period, and as a result should indeed be recorded in the data for more than one century. In the case of number of finds any of the resulting visualization should not greatly affected, because they all deal with the same bias and are therefore still useful for comparing amongst themselves. However, caution should be taken when making comparisons with other data sources.

Something else that is important is that just because production of a ware has been dated to a certain period, it does not mean that a deposit was actually from that period. The travel time of items as well as the fact that objects -especialy luxury items like Red Slip Wares- may have been used for a long time before being discarded means that the deposit can be of a later date than the ware's production. Where possible, the actual deposit's date or other dates supplied by the source were documented, if neither were available the form's production period as described in Hayes 1972 was used (Hayes 1972). Table 5.1 shows the amount of sites per century. It is clearly visible that the peak of Red Slip Ware's popularity is in the 4th-6th century, which is as expected. After all, as described in the previous chapter, production of CRSW and PRSW did not start until the 4th century and as a result an increase in the numbers of sites with Red Slip Wares is not unusual. Also in concordance with the literature is the drop in sites after the 6th century, when export of Red Slip Wares declined throughout the Empire, as well as the fact that the number of sites approaches zero in the 8th century as a result of the cessation of large-scale production of most Red Slip Wares.

*Table 5.1. Number of sites per century.*




Tables 5.2 and 5.3 (next page) reflect the exports of Red Slip Wares over the years. Because virtually all SRSW finds originate from a single site, it is left out of these results but its development over time will be discussed below.

Due to the extensive collection method of 5th-8th century CRSW sherds on a few sites in south-central Asia Minor, the

*Table 5.2. Percentage of finds per ware per century. SRSW and ERSW data left out.*

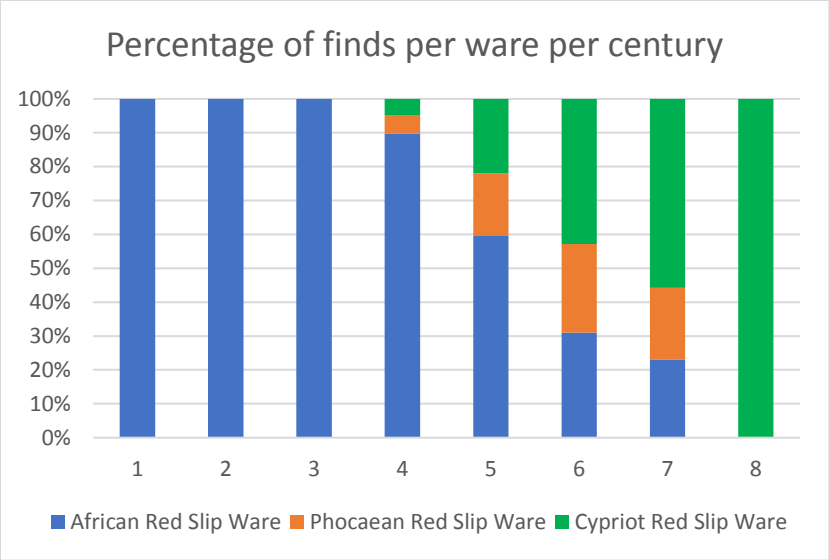
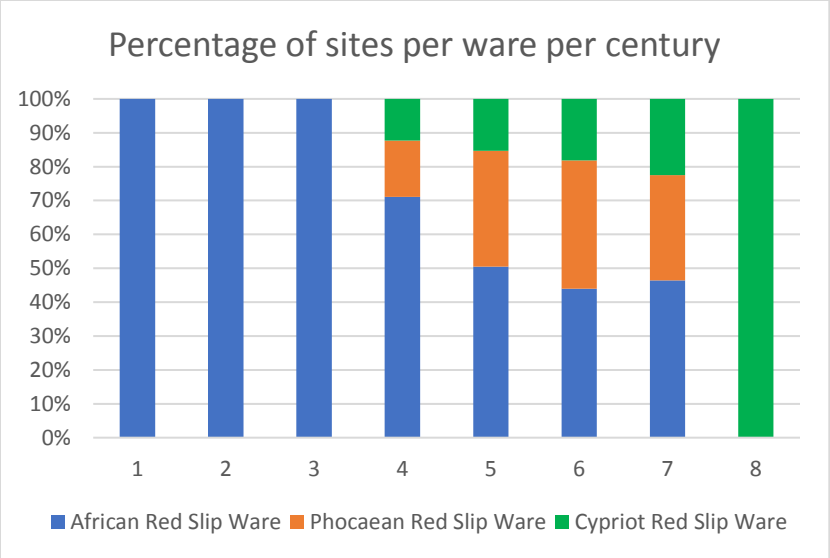



*Table 5.3. Percentage of sites per ware per century. SRSW and ERSW data left out.*




number of sites is most likely a better indicator for CRSW popularity during this time period than the total amount of sherds.

Tables 5.2 and 5.3 show, as expected, a marked difference in especially the percentages of and CRSW. In table 5.2, CRSW appears much more dominant in the later centuries than it does in table 5.3. There are large differences for ARSW, too: it appears to be an almost marginal ware in the 6th and 7th century, representing less than 20% of the finds. But in table 5.3 it is clear that ARSW is still very much present in the Mediterranean, being present on more sites than PRSW and CRSW. This could be explained by a decline in production of ARSW from the 5th century onwards (see below), while it still maintains a presence on many western Mediterranean sites where it does not face much competition from the other Red Slip Wares. The data for PRSW does not feature as big a difference between the two data representations as ARSW and CRSW, although it consistently has an around 10% higher share in table 5.3 than it does in table 5.2.

Regardless of the differences, when averaging the two tables it shows that ARSW was the most popular of the Red Slip Wares in the 4th and 5th century, but gradually lost some of its popularity until it disappeared entirely after the 7th century. CRSW steadily gained in popularity from the 4th century onwards, although exactly how much is hard to tell based on these two tables.

*Table 5.4. Number of ARSW sherds and sites per century. Values for the number of sherds (continuous line) displayed on left vertical axis, values for the number of sites (dotted line) displayed on right vertical axis. Grid lines are for left axis.*

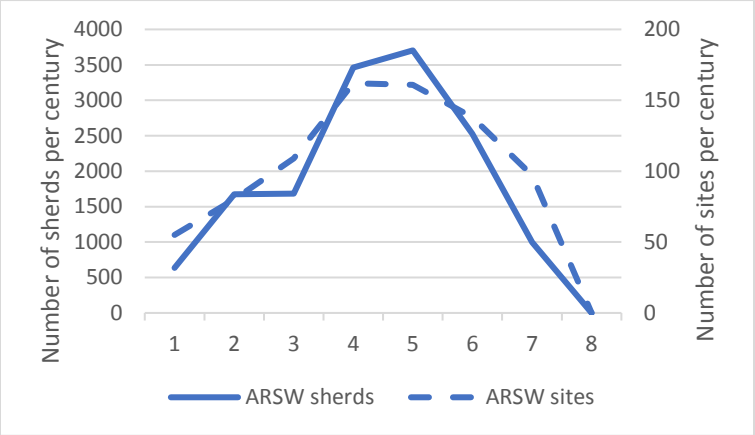



*Table 5.5. Number of CRSW sherds and sites per century. Values for the number of sherds (continuous line) displayed on left vertical axis, values for the number of sites (dotted line) displayed on right vertical axis. Grid lines are for left axis. Source: own work.*

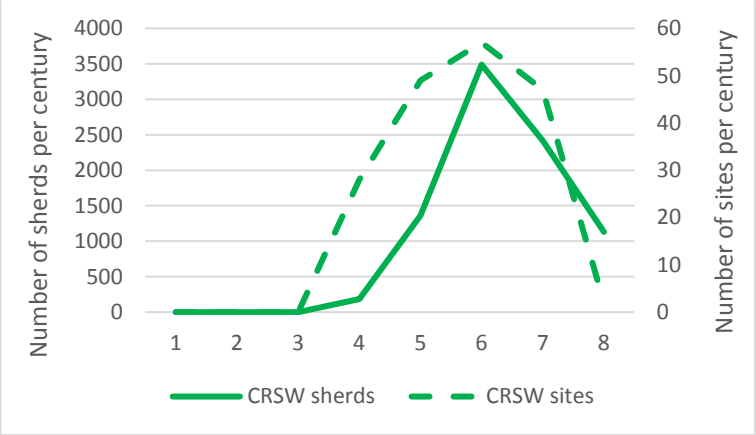
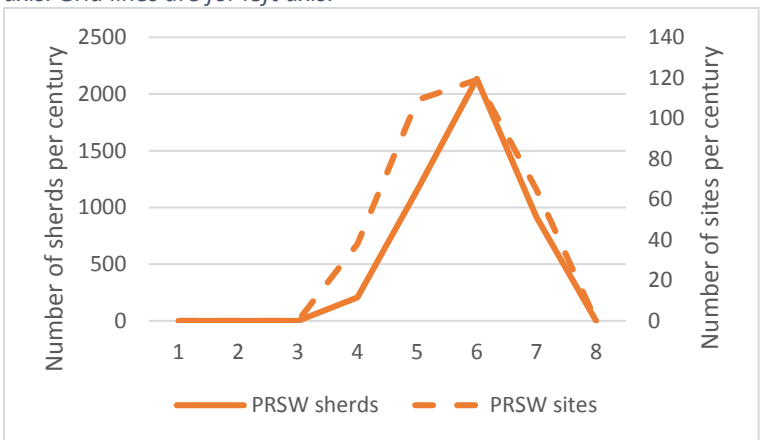



*Table 5.6. Number of PRSW sherds and sites per century. Values for the number of sherds (continuous line) displayed on left vertical axis, values for the number of sites (dotted line) displayed on right vertical axis. Grid lines are for left axis.*

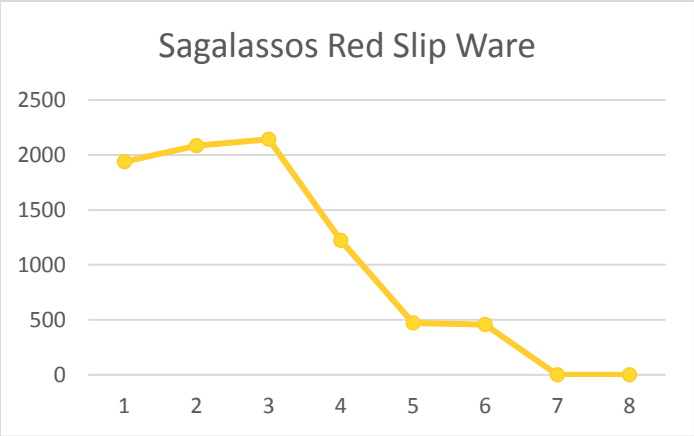



Similarly, PRSW also saw its share increase, but only up until the 6th century, after which its numbers began to decline.

The individual graphs of each ware show a similar trend. For ARSW (table 5.4), the export is highest in the 4th and 5th century, before steadily declining during the 6th and 7th century. CRSW, on the other hand, has its production peak in the 6th century (table 5.5), and although it also shows decline in the 7th century, there is still a significant amount of vessels being produced in the 8th century. The development of PRSW (table 5.6) is very similar to that of CRSW: its exports peak in the 6th century but the decline is much more sudden, leaving no trace of PRSW production less than two centuries later.

SRSW (table 5.7, next page) offers an opportunity to study not its exports, but only its production due to all but one of the sherds recorded in this thesis originating from its production site of Sagalassos. And as a result of the extensive collection of sherds there from throughout the Late Roman period, it should be highly reflective of the different levels of production during that time. And the picture it paints is very different than those of the other Red Slip Wares. SRSW's production

*Table 5.7. Number of SRSW sherds per century. No number of sites are shown because SRSW has only been recorded on two sites in this dataset.*




peak is not in the 5th or 6th century, but in the 2nd and 3rd century. There is a high number of vessels produced in the 1st century too, but it should be noted that in the case of SRSW this also includes a number of vessel forms that were produced in the 1st century BC. After the 3rd century there is a sharp decline in production, briefly stabilizing from the 5th to 6th century: the time when the other Red Slip Wares were at the height of their popularity. SRSW production appears to have ceased completely in the 7th century, a century before that of ARSW and PRSW did.

## 5.1 1st century and before

Only SRSW and ARSW are present in this period. And although ARSW has only been in production for a few decades, it is already widespread, including throughout the eastern Mediterranean (figure 5.1[4]). Most of the finds in this period, however, consist of less than five sherds. An exception is Cherchell, Algeria, where more than 400 sherds and vessels can be dated to the 1st century. But although there are several Algerian sites recorded with 1st century finds, there is a curious lack of finds in Tunisia. This indicates that at least some of the 1st century production centers in Tunisia are different from the ones in later centuries, several of which are recorded in this thesis. Earlier production might perhaps be taking place more in Algeria's coastal areas, with easier access to the sea than from some of the later inland Tunisian sites.

## 5.2 2nd century

In figure 5.2 it can be seen that in the 2nd century, ARSW has continued to spread across the Roman Empire, with vessels now being found in Portugal and the Danube area. In this century, the amount of recorded sites with ARSW in the western Mediterranean outnumbers those in the eastern part. There are also more western sites where more than five sherds were found than eastern ones, illustrating a more westerly focus of ARSW. And in contrast to figure 5.1 there are several Tunisian sites recorded with ARSW finds. This is also the period where the only recorded SRSW sherd outside of Sagalassos was found: in the eastern Crimea, on the Black Sea Coast, an area not that hard to reach by ship from Asia Minor. The sherd dates to the 2nd-3rd century.

[4] Figure 5.1-5.7 can be found in Appendix A.

## 5.3 3rd century

During this period, the picture for ARSW is not very different from that of the 2nd century. It does show an increase in finds on sites further inland -especially in the Danube area- and in the eastern Mediterranean, where the amount of sites nearly doubles (figure 5.3). The majority of sites in both these areas, however, consist of finds of less than five sherds. The amount of sites in the western Mediterranean remains largely stable, with some sites disappearing and some new sites appearing. Some of the 2nd century sites see their amount of ARSW sherds increase significantly into the 3rd century, for example Sagunto (Spain) and Porto Torres (Sardinia), from 20 to 123 and from 4 to 222 sherds, respectively (Reynolds 1995). The amount of central Tunisian sites, as well as the number of sherds found per site there increases in this period.

## 5.4 4th century

The trends of ARSW that could be seen in the previous century continue: more sherds were found in the east, more sherds were found on inland sites, and more sherds were found in Tunisia (figure 5.4). The 4th (and 5th) century is also the period the southernmost sherd in this dataset dates to: an ARSW sherd found in Adulis in modern-day Eritrea, on the Red Sea coast (Bes 2015).

Another outlier worth mentioning are 25 sherds found in Ezinge, Groningen: the only Red Slip Ware sherds found in the Netherlands (Nieuwhof and Volkers 2015, 29). It is not clear why Groningen would be the only place this far north in continental Europe to feature Red Slip Wares. Perhaps it was not, and other examples just have not been found or recognized yet. Roman imports are regularly found beyond the Empire's boundaries, including in places like Ireland, Scotland, Denmark, the Czech Republic and other areas (Grane 2013). As such, the presence of Roman imports on the coast of northern continental Europe is not entirely without precedent, and ARSW was found in numerous inland sites from the Mediterraean towards the north of continental Europe, including in Cologne.
Grane mentions the possibility that men from outside the Empire enlisted in its military or were otherwise hired by Romans, and returned home with Roman items in their possession (Grane 2013). A down-the-line kind of exchange would also be possible, but the fact that this is a single deposit and it is so far the only Red Slip Ware deposit in the area could also mean that these vessels were part of a single shipment, the only one to have transported ARSW there. This explanation is mentioned for the Cologne deposit, where it is suggested that, because the other ARSW finds in Cologne data to the same period, they were all part of the same shipment: perhaps one carrying grain (Friedhoff 1991).

CRSW and PRSW appear for the first time in this period. The distribution of CRSW is very limited, with relatively few sites and sherds recorded. The point furthest to the west in this dataset where CRSW is found in the 4th century is western Greece, but most finds are from the

easternmost part of the Mediterranean. Most sites for this period record less than five sherds, with only Alexandria (Egypt), Cyprus and northern Israel and Palestine recording higher numbers.

The picture of PRSW in the section on the Mediterranean coast east of Greece is similar to that of CRSW, although PRSW has a lower number of finds in the eastern corner of the Mediterranean. Its main focus area is the west of Asia Minor as well as the southeastern coast of Greece, meaning most results are located quite close to its production site. Although there are finds further away, too, in Libya, Croatia and the Red Sea Coast.

## 5.5 5th century

The distribution of ARSW in this century is similar to that of the 4th century (figure 5.5). In both the eastern and western Mediterranean the amount of sites and sherds found stays largely the same. The stagnation of ARSW exports in the 4th-5th century was already visible in table 5.4.

CRSW exports expand during the 5th century, which is visible in both the number of sites and the number of sherds found per site. Although there are still no CRSW exports west of Greece, the number of sites in Greece itself has increased and there is also a recorded find in Libya.

It is PRSW that presents with the most dramatic expansion in this period: in the 4th century, PRSW was not recorded west of Croatia. Now, there are finds in Sicily, France, Portugal and the British Isles as well. This includes several finds of one or two sherds in Ireland and England where, although rare, PRSW appears to have been more popular than ARSW.
Besides just expanding geographically, the number of PRSW sites and sherds sees a major increase in the eastern Mediterranean too: from 38 to 90 sites. Its core export area still appears to be western Asia Minor and the southeastern coast of Greece, where most of the larger deposits were found.

## 5.6 6th century

This period is marked by the decrease in ARSW, both in number of sites and number of sherds (figure 5.6). The geographic range is still largely the same, with finds in England, central France and northern Spain. Finds in the British Isles increase somewhat, with the northernmost find of any Red Slip Ware (from Iona, Scotland) being dated to this period (Hayes 1972). The only Irish ARSW sherd dates to this period as well, although it cannot be conclusively classified as ARSW (O'Sullivan *et al* 2014). The ware disappears entirely from the central northern part of the Empire, around the Alps and the Danube. In the Mediterranean coastal area there is a less dramatic decrease: ARSW is still present in most coastal areas, there are simply less sites which record ARSW.

In contrast, CRSW exports can cautiously be said to be increasing, although this is mostly in terms of amount of sites rather than number of sherds per site. It is here that the research bias

in sixth century CRSW sherd numbers can be seen: table 5.5 would give cause to believe that a map might show a similar increase in sites between the 5th and 6th century for CRSW as it does for PRSW from the 4th to the 5th century. But this is not the case: there is a small increase in CRSW sites in this period (from 48 to 58), but nothing of the scale table 5.5 would suggest. This shows that the major increase in 6th century finds shown in table 5.5 is largely attributable to the extensive sherd collection done in south-central Asia Minor.

The geographical range of CRSW stays the same as in the previous period, being largely restricted to the eastern section of the Mediterranean starting at Greece. In the 6th century, however, there is a small, but major exception: two CRSW sherds were found in Portugal, and seven more in Spain (Quaresma and Morais 2012; Reynolds 1995). A possibly theory of its origin has already been offered in paragraph 4.2.

In figure 5.6 there are two trends visible with regard to PRSW: on the one hand, the geographic range of PRSW decreases slightly, with several of the sites on the edge of PRSW's distribution range disappearing. For example, 5th century sites with PRSW pottery in France, Italy, the Crimea, Romania, Egypt and inland Syria no longer feature any 6th century PRSW finds. On the other hand, the amount of PRSW sites and sherds in the eastern Mediterranean increases. This shows that there was not necessarily any PRSW decline in the 6th century, on the contrary: table 5.6 shows that the peak of PRSW's popularity was in the 6th century. As a result, the narrowing geographical range merely shows a change of focus.

## 5.7 7th century

In the 7th century, all the wares shift their focus towards the eastern Mediterranean. The amount of sites in the west featuring any kind of Red Slip Ware is nearly halved (figure 5.7). Imports can still be found in most areas, but are further restricted to coastal regions.

ARSW continues its decline. It has not only lost most of its western market, but the amount of sites and sherds in the east decreases as well. CRSW, on the other hand, remains stable and perhaps even shows a slight expansion in this period, in contrast to the decline suggested by table 5.4. Although there is a slight decrease in the number of sites, mainly in Greece, the number of CRSW finds in southern Asia Minor, Cyprus and Israel increases.

PRSW also appears to be staying closer to home, with a decrease in sites in Greece, Israel and Palestine and the northeastern corner of the Mediterranean, but an increase in Asia Minor. The number of finds, however, decreases too. It is still present in the western Mediterranean, but only in very small quantities.

# 6. Vessel form

Seven different vessel forms were distinguished in this database. Where possible, the shape mentioned in Hayes' vessel form description was used (Hayes 1972). Generally, the forms are differentiated by depth. From deep to very shallow, they are: deep bowl, shallow bowl, dish and flat-based dish, plate. Examples are shown in figure 6.1. Shallow bowls are often more spherical, and dishes more rectangular. Flat-based dishes can be differentiated from regular dishes by the absence of a rim at the base, serving as a foot. To avoid having categories with only a few examples, mugs and casseroles were classified under deep bowls. Sometimes the difference between dishes and shallow bowls and that between shallow bowls and deep bowls can be rather arbitrary. As a result, the amounts given in table 6.1 could vary depending on interpretation. The differences in amounts, however, are significant enough to be able to gather trends. Figures 6.2-6.4 (Appendix A) show all the vessel forms on a map, seperated by pottery type. Where multiple forms are present on a single site, the percentages are represented in pie charts. Vessel forms were not recorded for ERSW and SRSW (although vessel form information for SRSW is available in Poblome 1995), and as a result they will not be discussed or represented in any tables or maps in this chapter (Poblome 1995).

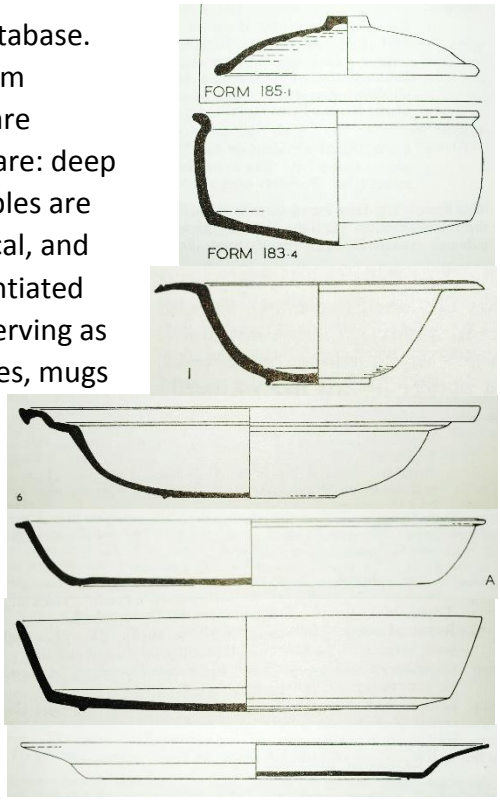
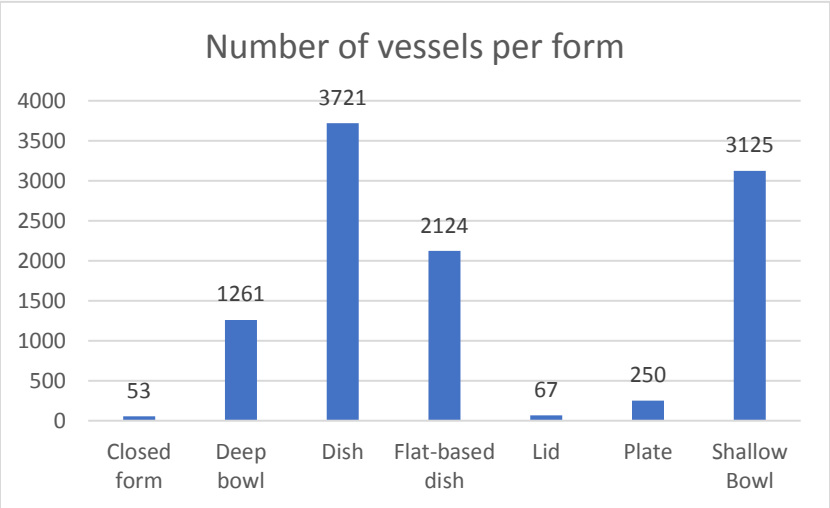



*Figure 6.1. Examples of different vessel forms. From top to bottom: lid (form 185) and casserole (form 183); deep bowl (form 52); shallow bowl (form 67); flat-based dish (form 58); dish (form 31) and plate (form 45). Source: Hayes 1972, 54, 64, 74, 92, 114, 202.*

In table 6.1, it can be seen that the most common forms are dishes, shallow bowls, flat-based dishes and deep bowls in descending order. Plates, lids and closed forms were much rarer. If the amounts for both kinds of dishes and bowls are added together there is a total of 5845 dishes and 4386 bowls, showing that dishes were the most common vessel form.

*Table 6.1. Number of vessels per form.*




Vessel form data in the maps is presented by pottery type. However, no conclusions can be drawn based on the absence of certain ARSW vessel forms in the east, and

certain PRSW vessel forms in the west. This is because most of the information about vessel form is only available for sites in the western Mediterranean because they were not recorded in Bes 2015 which is the source for most of the sites in the eastern Mediterranean (Bes 2015). In addition, in instances where vessel form is recorded in the eastern Mediterranean almost all values are for PRSW. An exception is Israel and Palestine, where almost all values are for CRSW.

## 6.1 Closed forms and lids

Closed forms and lids are, as mentioned earlier, rare. Of the sites with recorded vessel forms, none of the eastern Mediterranean sites east of Greece feature lids or closed forms (figure 6.5 and 6.6[5]). Although closed forms and lids have been found in the Danube area, showing they traveled inland as well, none of the Atlantic sites in Portugal and the British Isles record them. This suggests that ship trade of closed forms and lids might have remained relatively short distance: all the coastal sites featuring closed forms and lids recorded in this thesis are located within a radius of ± 1000 kms from Tunisia. Or perhaps they faced too much competition from local coarse ware producers in these other areas.

## 6.2 Deep bowls

Deep bowls are found throughout the Mediterranean, with the exception of the Black Sea sites and, curiously, the Greek sites (figure 6.7). However, Hayes 1972 mentions a few finds from the Athenian Agora - vessel forms of which are not recorded in this database due to values from Bes 2015 being used to record Athenian deposits (Bes 2015, Hayes 1972). These are of form 70, 71, 74 and 94 (Hayes 1972, 119-120, 124, 148). For the few other Greek sites only a few vessels were recorded, making it likely that the absence of any Greek finds of deep bowls in this dataset is a result of data collection. In Esdrael (Palestine), two PRSW and an ARSW sherd were found. In Split (Croatia), the finds were thirty sherds of ARSW and three sherds of PRSW deep bowls.

## 6.3 Dishes and flat-based dishes

Both very common forms, “regular” dishes and flat-based dishes can be found in all areas throughout the Empire, with the exception of the British Isles where no flat-based dishes are recorded (figures 6.8 and 6.9). Together they make up over half of the total amount of sherds with recorded vessel forms. On the only two sites where PRSW flat-based dishes were recorded, Split and Troia (Asia Minor), they occur together with ARSW.

## 6.4 Plates

Plates have been recorded throughout most of the Mediterranean, except for the northeastern (Black Sea area) and northwestern (British Isles) corner (figure 6.10). The third and most notable area where plates are absent is Asia Minor: none of the sites there with recorded vessel forms feature any plates. It is probable that this is merely a reflection of data collection. Vessel form was only recorded for a few sites in Asia Minor, with almost all only having a small

[5] Figures 6.5-6.11 can be found in Appendix A.

number of sherds recorded. The only large data source here is the CRSW production area, and CRSW does not feature any plates.

## 6.5 Shallow bowls

Shallow bowls are the second most common form in Red Slip Ware: together with dishes and flat-based dishes it makes up over 80% of the dataset of vessel forms. As a result, it can be found in all areas with recorded vessel forms, with the exception of the Crimea area (figure 6.11). Since the dataset for the Crimea and Russia only consist of four sherds, it is not possible to draw any conclusions from the absence of any ware or form there. Since all known sites in the British Isles were recorded and records include information about vessel form, it is suitable for comparing its data amongst itself. With regards to pottery types, PRSW shallow bowls are more common than ARSW shallow bowls in the British Isles.

# 7. Decoration

The methods used to record decoration have been described in paragraph 1.3. As a result of this method, it should be taken into account that sherds recorded as having religious or mythical decoration may also contain animal, human, floral, botanical or geometric decoration, etcetra. Rouletting and circles were only recorded as decorations if they were used extensively, for example rouletting across the entire vessel or more than four concentric cirles. ERSW is not discussed in this chapter because no decoration has been recorded for the ERSW sherds in the dataset.

Table 7.1 shows the amount of sherds per decoration type. It is evident that geometrical decoration is by far the most common type. Part of this is due to the large amount of vessels with geometric decoration documented in Sagalassos (representing 400 out of the 552 sherds), but even when not taking the Sagalassos sherds into account geometric decoration is twice as prevalent as any other category (table 7.2). The number of sherds of the other categories are, despite their record method, remarkably similar: religious and mythical decoration is only marginally more common than the other two categories.

*Table 7.1. Number of sherds per decoration type..*

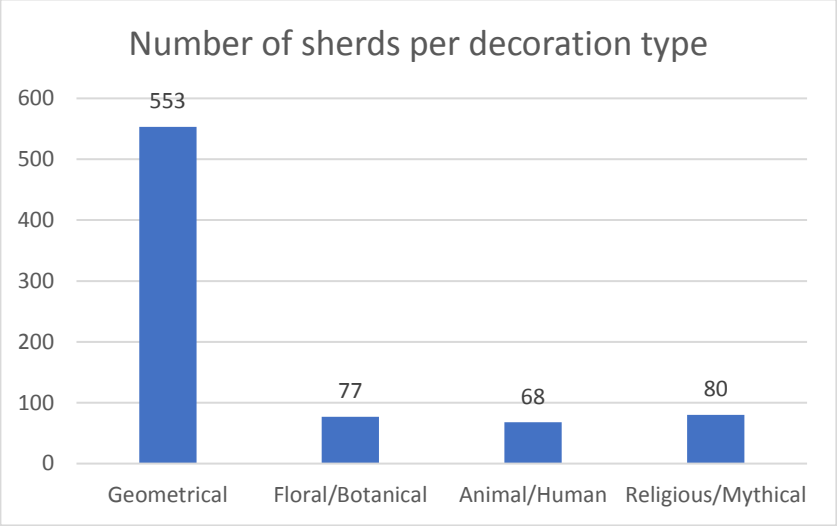
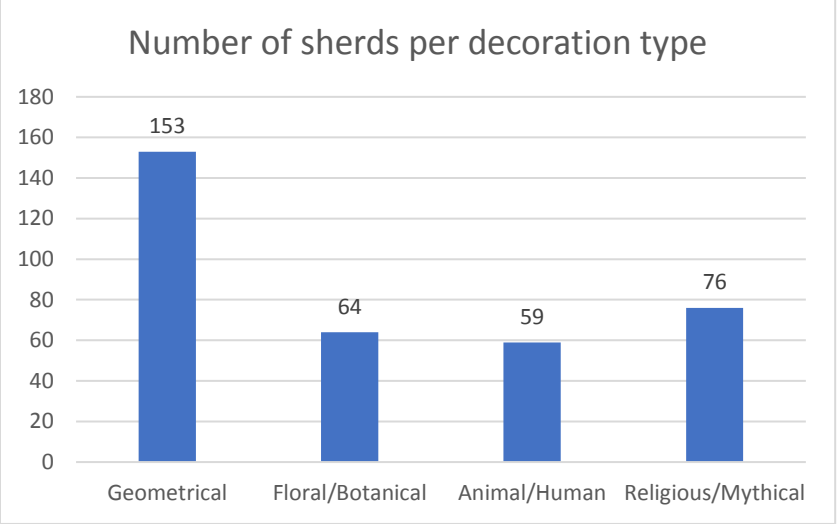



*Table 7.2. Number of sherds per decoration type, excluding Sagalassos data.*




All decoration found could be fit within one of the four categories, except for one. In Carnuntum, located in modern-day Austria close to the border with Slovakia, a sherd was found with a depiction of a boat on it (Hárshegyi and Ottományi 2013). No religious context is mentioned and no picture supplied, but it is possible that this was part of a

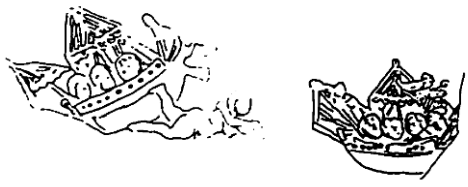


*Figure 7.1. Two ARSW motives depicting Jonah being thrown into the sea. Source: Armstrong 1993, Pl. XLVII.*

religious scene, perhaps part of a scene about Jonah, which also feature boats. However, other known examples displaying the scene of Jonah being thrown overboard are relatively easy to recognize (figure 7.1, previous). It is therefore more likely that this fragment simply depicted fishing or seafaring.

## 7.1 Vessel form

Because all decoration categories can be found throughout the Empire (figures 7.2-7.5, Appendix A), there will be no discussion as to the spatial distribution of certain decorations. Analysing the appearance of different pottery types in different areas is not useful, since they represent a data collection bias, similar to that described in the last chapter for vessel form. In addition, the sample size is simply too small to be able to draw any conclusions on such a large scale. An analysis as to what decoration is found on what vessel form and vice versa could be helpful, even though the amount of sherds with decoration is relatively low. The low number of sherds for which both decoration and vessel form is recorded is a result of the author not recordeding vessel form for the Sagalassos dataset, which contains the most information about decoration, as well as because information about vessel form and/or decoration was not available in a number of other sources.

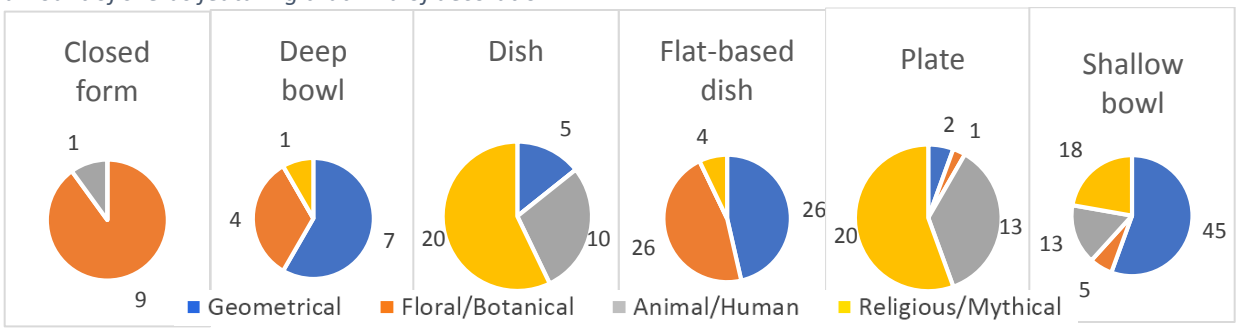
*Table 7.3. Number of sherds recorded per decoration category.*

| Decoration type | Number of sherds |
|---|---|
| **Geometrical** | 84 |
| **Floral/botanical** | 45 |
| **Animal/human** | 37 |
| **Religious/mythical** | 62 |

As a result, only 229 fragments were available for this analysis. The amount per decoration type can be seen in table 7.3. Most of the sherds belonged to ARSW, some to PRSW and one sherd to CRSW. As can be seen in table 7.4, deep bowls and closed forms feature the least decoration. Of the other forms, deep bowls, flat-based dishes and shallow bowls record a majority of geometric decoration, which in flat-based dishes ties with floral and botanical motives.

Recorded decorations for deep bowls and flat-based dishes are almost exclusively floral and botanical or geometrical, with only very few religious or mythical motives found. No sherds with animal or human scenes were found for these two forms, and although it is possible that some of the fragments with religious or mythical motives also featured motives with humans or animals they would still be outnumbered by the amount of sherds with floral, botanical and geometrical decoration. Conversely, religious, mythical, human and animal scenes are very

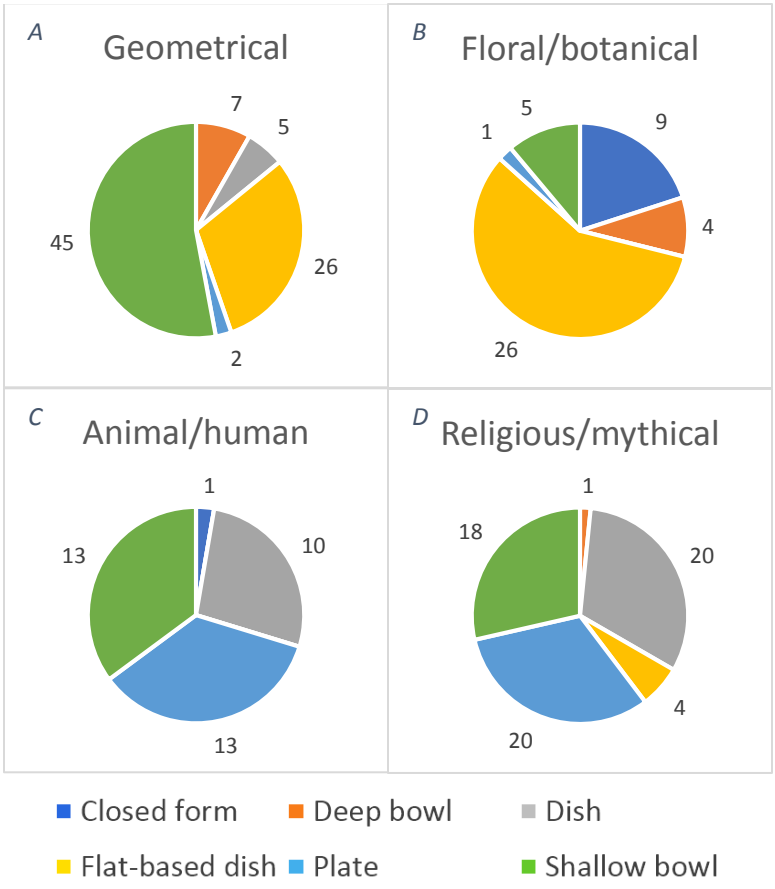
*Table 7.4. Relative amount of decoration per vessel form. The numbers presented next to the slices represent the amount of sherds featuring that kind of decoration.*



popular on dishes and plates. There, only a small amount of sherds feature just floral, botanical or geometric decoration. Floral and botanical motives are present on shallow bowls too, but are not featured as often as geometrical decoration.

Of the closed forms with recorded decoration, only one was found with human or animal representations, and none with mythical or religious. Decoration consists mostly of floral or botanical motives.

*Table 7.5. Percentage of vessel forms per decoration type.*




When reversing the data and looking at the percentage of wares where a decoration category was recorded, the picture is somewhat different (table 7.5). Because although in shallow bowls a minority of the decoration consists of animal, human, religious and mythical decoration, shallow bowls make up a significant percentage of the wares on which these decoration categories are found (table 7.5C and 7.5D). Both categories appear equally often on shallow bowls, dishes and plates, with religious and mythical decoration also appearing on a few flat-based dishes.

More than 50% of the recorded examples of floral and botanical decoration, on the other hand, appear on flat-based dishes (table 7.5B). The other vessel forms, however, are distributed fairly equally. The remaining sherds were recorded on closed forms and in equal amounts on deep and shallow bowls, with one example being found on a plate. The only vessel form that most commonly features geometrical decoration is shallow bowls, although it can frequently be found on flat-based dishes as well (table 7.5A).

## 7.2 Ware

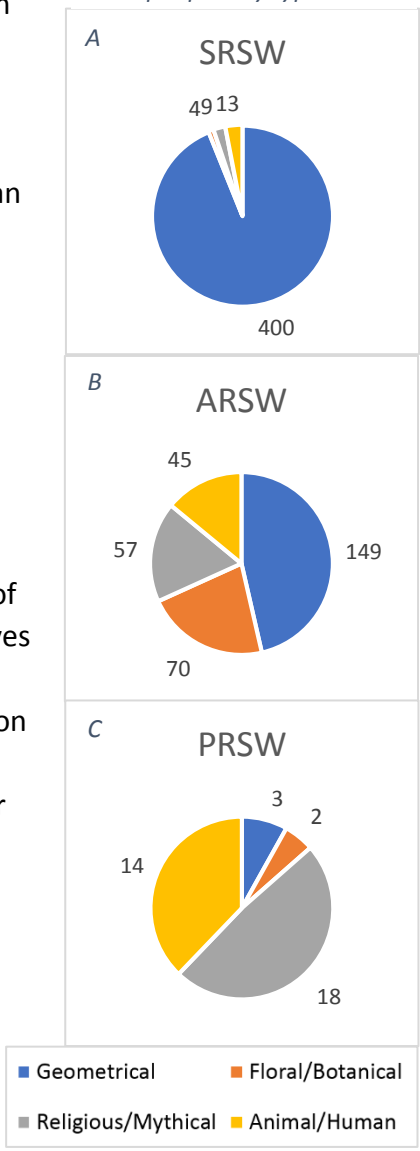
In the previous analysis, the data from all three pottery types with recorded decoration and vessel forms was put together. However, it might also be useful to look at differences between the different pottery types. Differences in distribution per vessel form per ware was not analysed, because vessel forms were not recorded for SRSW and the recorded amount of decorated sherds of PRSW is too low to be able to make a useful analysis. As a result, only data regarding the amount of sherds per decoration category per ware is presented. Because data

on vessel form is not needed for this analysis, the results for SRSW are presented here too. CRSW is not presented in this paragraph because it only had one recorded decorated sherd, featuring geometric decoration.

In SRSW, almost all of the decoration consists of geometrical motives (table 7.6A). Of the others categories, animal and human decorations are the most popular, followed by religious and mythical and then floral and botanical decoration, although it should be taken into account that sherds with animal, human, religious and mythical decoration might also feature floral or botanical decoration.

Similarly, in ARSW geometrical decoration is also the most common decoration type, compromising nearly half of the recorded decorations (table 7.6B). But when comparing the popularity of the other three decoration type on ARSW to that of those on SRSW, the order is reversed: botanical and floral motives are the second most prevalent type in ARSW, and animal and human the least prevalent, with religious and mythical decoration occupying a third place in both. This means that floral and botanical decoration in ARSW are more frequently used on their own or in combination with geometrical forms than in SRSW, where they appear more commonly together with religious, mythical, animal or human decoration, if at all.

*Table 7.6. Number of decorated sherds per pottery type.*




PRSW, on the other hand, shows a completely different picture (table 7.6C). Sherds with geometric decoration are sparse, as are those with floral or botanical decoration. Most of the recorded decorated sherds feature animal, human, religious and mythical designs. It is possible that this picture is the result of a documentation bias, and that the actual proportions of the decoration types for PRSW are more similar to those for ARSW, or even more similar to those for SRSW. Hayes' 1972 work is an important source for decorated sherds in this thesis, but its drawback is that it selects vessels and sites and as a result does not provide a complete picture of ware proportions (Hayes 1972). Rarer and more common motives are presented in almost equal quantities. To prevent the possibility of the research bias, a few additional charts will be provided, showing the proportions of wares across a single site. The sites have been selected because their pottery assemblages have been published in full instead of only a selection. For PRSW, this is the site of Bracara Augusta, Portugal (table 7.7), and for ARSW this is Sperlonga, Italy (table 7.8) and Split, Croatia (table 7.9). These three were the only recorded sites for their respective wares with enough mentioned decorated sherds to make a useful comparison.

*Table 7.7. Number of sherds from Bracara Augusta featuring decoration of a certain category. Source: Quaresma and Morais 2012.*

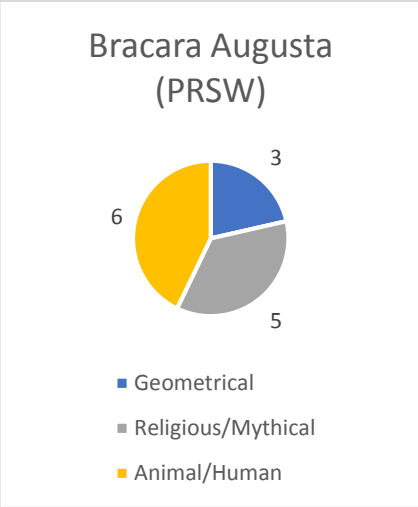



*Table 7.8. Number of sherds from Sperlonga featuring decoration of a certain category. Source: Saguì 1980.*

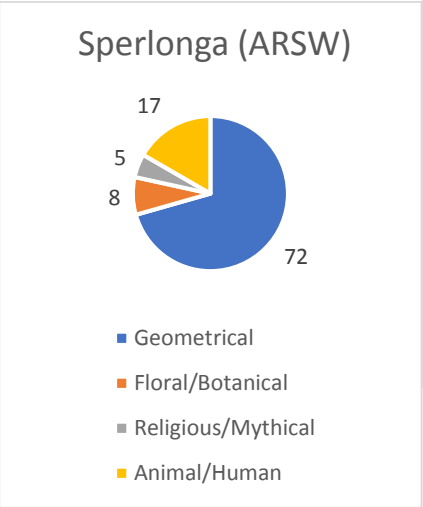
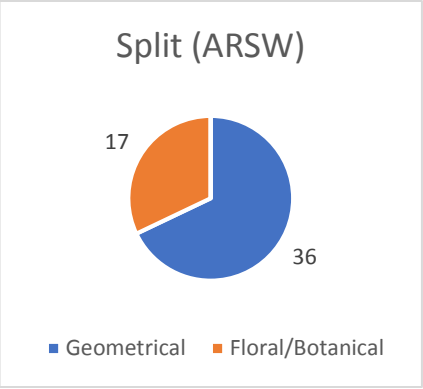



*Table 7.9. Number of sherds from Split featuring decoration of a certain category. Source: Schrunk 1984.*




When comparing the data from Bracara Augusta to the overal data of PRSW, two things are immediately obvious. One, all three of the mentioned PRSW sherds with geometric decoration originate from Bracara Augusta. Two, there were no sherds found with floral or botanical decorations. And although extreme caution should be taken when extrapolating data from a single site, it would appear that geometric patterns are more common in PRSW than the overall data would suggest. The percentages of religious/mythical and animal/human designs, however, mirror those of the general data. This could mean that, although geometric motives in PRSW might have been more common than suggested in table 7.6C, they were still secondary to decorations from these two other categories.

As for the data from Split and Sperlonga, they confirm the popularity of geometrical design in ARSW, although they compromise closer to two thirds of the complete assemblage in both cases (table 7.8 and 7.9). This in contrast to the overal assemblage, where they represent less than half of the total sherds. The percentage of sherds with animal and/or human decoration in Sperlonga is roughly the same as in the overall ARSW data, but there is a lower amount of floral, botanical, religious and mythical decoration. In Split, on the other hand, all the decoration consists of either geometrical, or floral/botanical decoration, with none of the other categories present. It is unknown why the other two decoration categories are not present on ARSW in Split, although several PRSW sherds with religious decorations have been recovered there.

*Table 7.10. Number of ARSW decorated sherds per century per decoration type.*

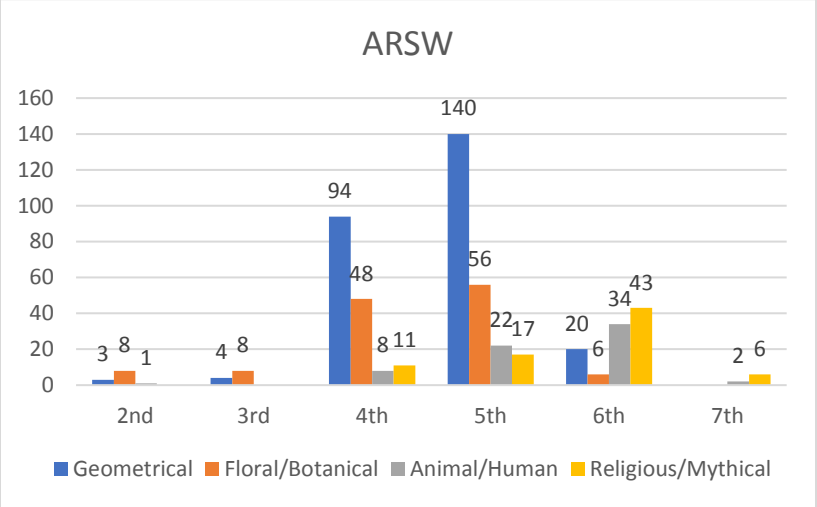



*Table 7.11. Number of PRSW decorated sherds per century per decoration type.*

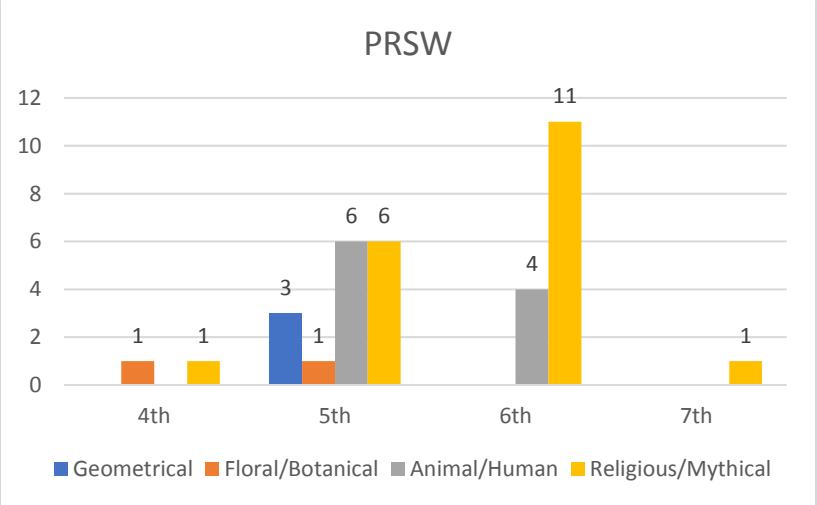
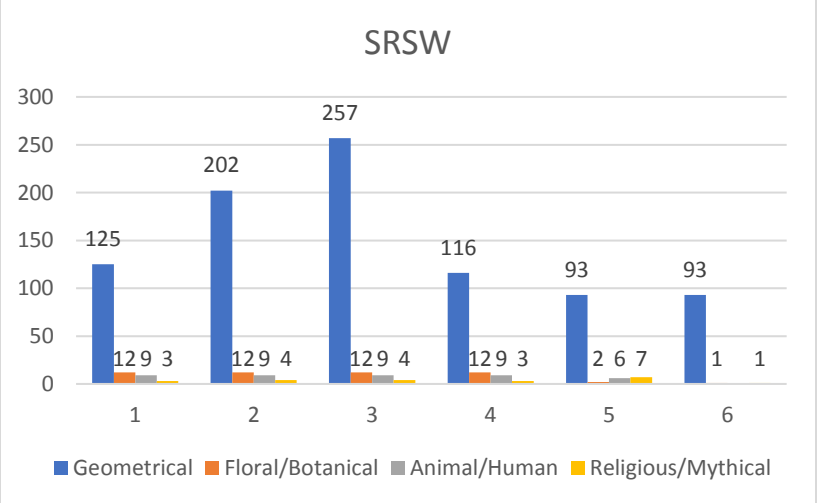



*Table 7.12. Number of SRSW decorated sherds per century per decoration type.*




## 7.3 Date

When comparing amounts of decorated sherds per century, the numbers do not differ that much from the overall data. For ARSW, the centuries with the largest number of both decorated and overall sherds in the dataset are the 4th an 5th century (table 5.4 and 7.10). For PRSW, this peak is in the 5th and 6th centuries (table 5.6 and 7.11); for SRSW in the 2nd and 3rd centuries (table 5.7 and 7.12). For PRSW, however, the difference between the amount of decorated sherds in the 5th and 6th centuries is less pronounced than in the general data, although conclusions are hard to make based on the small amount of sherds. In the case of SRSW, there is a more pronounced increase in the number of decorated sherds from the 1st to 3rd century, and the difference between the 4th and the 5th and 6th centuries is smaller than it is in the overall data.

With regards to the different decoration categories, those in ARSW show cautious trends. No decorated sherds were recorded for the 1st century, but in the 2nd and 3rd century almost all of the decorations are geometrical, floral or botanical. The total amount of

decorated sherds for this period is low. In the 4th century the other decoration categories start to appear, but they are stil outnumbered by floral, botanical and especially geometric designs, the latter taking up almost 60% of the decorated sherds in the 4th and 5th centuries. During this time decorated vessels start to appear in greater numbers.

From the 6th century onwards, decoration changes. Geometrical, floral and botanical designs appear to be losing popularity, although they might still be appearing more often, only together with animal, human, religious or mythical images. In the 7th century, there is a sharp drop in the number of decorated sherds, and no sherds with only geometrical, floral and botanical motives have been recorded: only decorated sherds in the categories animal and human, and especially religious and mythical.

The fact that this is not simply a result of the general drop in recorded 7th century sherds can be seen in table 7.13. The documentation bias regarding decorated sherd should be taken into account here for the ARSW and PRSW data, and as a result these numbers cannot be used as absolute percentages of decorated wares. They can be used, however, for comparing the popularity of decorated vessels in different time periods for the same ware. When looking at the data in this way, a bell curve is visible for ARSW: there is a relatively low percentage of decorated sherds in the 2nd and 3rd century, increasing through the 4th and coming to a peak in the 5th century, after which it recedes again in the 6th and 7th century to the levels of the 4th and 3rd century respectively. This analysis is helpful because it shows that the difference in the amount of decorated sherds between the 5th and 6th century is not only the result of a possible decrease in popularity of decorated vessels, but also at least partly a reflection of the decrease in recorded sherds in the same period.

Because there are only a few recorded decorated PRSW sherds, there is not a lot of analysis possible. However, a few cautionary conclusions can be made. Its decoration trends appear similar to ARSW: the geometric, floral and botanical designs seem to have been used mostly during the 4th and 5th centuries and decreased or disappeared after that (table 7.11, previous page). Mythical, religious, animal and human designs start appearing in the 4th century and increase in popularity until the 6th century, with decoration in general becoming scarcer in the 7th.

SRSW shows a quite different image, with geometric decoration remaining popular throughout its production period (table 7.12, previous page). The other decoration categories appear to have stayed relatively stable during this time as well. Tabe 7.13 shows an increase in decorated SRSW vessels in the 5th and 6th centuries, resembling ARSW in this aspect.

*Table 7.13. Percentage of sherds with recorded decoration per century AD. Data for PRSW is left out because of the low number of sherds and small differences between the percentages.*

| | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|---|---|---|---|---|---|---|
| **ARSW** | 0 | 1.9 | 1.5 | 9.3 | 13.1 | 9.3 | 1.4 |
| **SRSW** | 7.7 | 10.9 | 13.2 | 11.5 | 22.9 | 20.7 | 0 |

# 8. Discussion

In this chapter, the gathered data will be compared against the literature from chapter 2. In paragraphs 8.1 and 8.2, there will first be a brief summary of the literature relevant to the topic, followed by a summary of the gathered data, after which the differences and similarities between the two will be discussed. For paragraphs 8.3 and 8.4, few literature is available so they will mostly be concerned with summarizing and discussing the results from the dataset only.

## 8.1 Pottery type

### 8.1.1 ARSW

For ARSW, focus during its early period was thought to have been mostly in the western Mediterranean, with imports not becoming popular in the east until the 4th century (Bes 2015, 134). In addition, Spain would have been expected to have a lower presence of early ARSW due to the popularity and production of Hispanic terra sigillata there until the 4th century (Hayes 1972, 11-13). ARSW was designated the most common of the Red Slip Wares, being common across the entire Empire except for the northwestern part.

The dataset shows a roughly equal number of sites in the eastern and western Mediterranean during the 1st century. In the 2nd century the amount of sites and the size of the deposits in the west starts to outnumber those in the east, with the eastern Mediterranean sites recording less sherds and slightly fewer sites. The differences in number of finds increases into the 3rd century, with eastern sites still recording few sherds, although the number of sites is once again comparable. The 4th century sees the number of eastern sites increase dramatically, although the number of sherds per site is still relatively low compared to those in the west. In Spain, there is not much of a distinction to be seen in the number of sites in the first four centuries AD. The amount of sites and number of sherds per site increases with time, but this happens in most areas and is most likely a reflection of increased production, export and popularity of ARSW in general, rather than something happening in Spain alone. Most of the sherds recorded in this dataset are ARSW and it has been found in all corners of the Empire and beyond, including Scotland, Eritrea, Morocco and the Netherlands, areas where no other Red Slip Wares have been recorded in this dataset (Bes 2015; Hayes 1972). But only two sites with ARSW have been recorded here in the continental European northwest (one in Germany and one in the Netherlands), and as a result ARSW finds can be called very rare in this area (Friedhoff 1991; Nieuwhof and Volkers 2015).

A more westerly focus of ARSW can be seen in this dataset, but it is only a slight preference. In the 1st century AD exports to the western and eastern parts of the Mediterranean are roughly equal. Perhaps a larger difference between the two areas does exist, and would show up if more western sites were to be included in the dataset. The amount of ARSW found in the eastern Mediterranean already increases significantly in the 3rd century, a trend which continues into the 4th century. This 4th century increase happens in other parts of the Empire

too, but is more significant in the east and as a result can tentatively be seen as an increase in popularity in that area. There is no visible lack of Spanish sites and finds in the 1st-3rd century, when Hispanic sigillata supposedly would have hindered imports. Based on this dataset, ARSW was indeed the most popular Red Slip Ware overall, though in a few areas PRSW was more common. ARSW finds have been made mostly in coastal areas, although they were also found in some riverine areas inland.

### 8.1.2 PRSW

The popularity of PRSW, according to the literature, was mainly restricted to the eastern Mediterranean and areas surrounding the Black Sea (Arthur 2008, 162). In the dataset, PRSW is common throughout the eastern Mediterranean, with other sites dotted throughout the west. PRSW is recorded as the most common Red Slip Ware in the British Isles.

The eastern Mediterranean being the main focus area of PRSW is confirmed in the recorded data. Few Black Sea sites were recorded for this thesis, so any possible popularity there cannot be confirmed. PRSW does have a regular, though scattered presence in the western Mediterranean, with high number of finds being recorded there and the Iberian peninsula in particular. The find density in the British Isles is remarkably high, especially when considering how much distance there is between other western Mediterranean sites with PRSW finds. It is unknown why the frequency of finds would suddenly increase in such a far-away area. Perhaps they are a result of differences in other imports, as explained for Egypt in paragraph 4.3.

### 8.1.3 CRSW

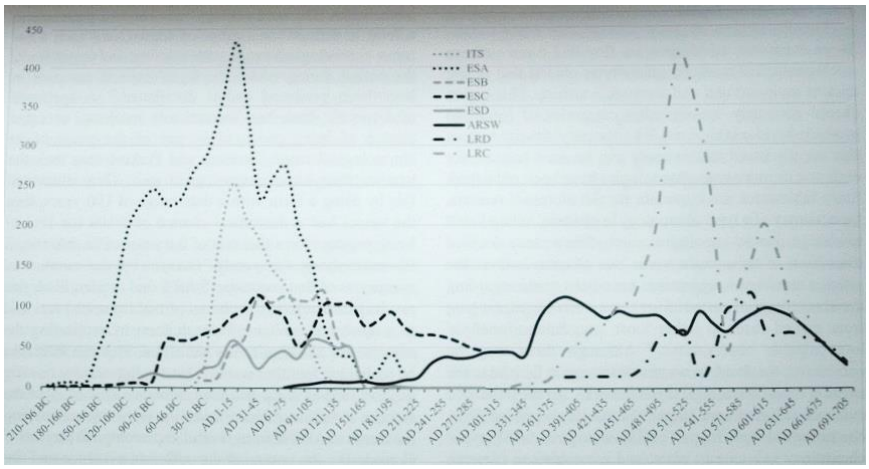
CRSW was thought to have been a mostly local ware, with exports concentrated in the easternmost part of the Mediterranean (Bes 2015, 137). In the dataset, CRSW is recorded mostly in Cyprus and Israel and Palestine and to a lesser extent in Egypt, Turkey, Syria and Greece. Some outliers were found in eastern Libya, as well as in the Iberian peninsula.

The dataset confirms the literature: CRSW has a very limited distribution network compared to ARSW and PRSW. But its range should perhaps be extended to include the entire eastern Mediterranean due to the number of sites with CRSW sherds in Greece and western Turkey. Although the number of sherds found in these more western areas of the Mediterranean is lower than in the easternmost part, the amount of sites with CRSW finds there is too big to ignore. In addition, the distribution pattern in Greece is similar to that in the northeastern corner of the Mediterranean (southeastern Turkey and Syria): both areas feature a relatively low number of finds. The two sites in Spain and Portugal with CRSW finds are interesting. They appear isolated, with no other recorded CRSW finds between Greece and Spain. Perhaps they are isolated finds, but at least the sherds from Valencia appear to have been imported for a longer period of time with forms dating from the 5th-7th centuries. Perhaps future research will bring to light more CRSW sherds in the Western Mediterranean, or if not these Iberian sherds will be proven to have indeed been isolated finds.

## 8.2 Date

### 8.2.1 1st-3rd century

*Table 8.1. Graph of number of sherds per 15-year interval. Graph starts at 210-196 BC; ARSW emerges at 61-75 AD; PRSW at 301-315 AD; graph ends at 691-705 AD. Source: Bes 2015, 6.*




Because CRSW and PRSW only started production in the 4th century, only ARSW and SRSW are present in this period (Bes 2015, 8). Only two sites with SRSW are recorded in the dataset, meaning the rest of the sites in this period only feature ARSW. The start and end date for wares will not be questioned in this chapter, because deposits are often dated using pottery sherds. And if the sherds are used for dating deposits, the deposits cannot prove a different date for the sherds. Data showing popularity of the Red Slip Wares used in this chapter are from Bes 2015 and as a result only concern data from the eastern Mediterranean (Bes 2015, 6). Reynolds has published a similar graph for the western Mediterranean, but his only incorporates ARSW data from five sites (three in Italy, one in Spain and one in Algeria) and as a result is hardly a representive sample of all western Mediterranean sites (Reynolds 1995, 431). The lack of western representation is mostly problematic for ARSW analysis, because most data from PRSW and especially CRSW is located in the eastern Mediterranean and as a result is not impacted much by a lack of western representation in the data.

### 8.2.2 4th-5th century

Table 8.1 shows that the first peak for ARSW exports in the eastern Mediterranean lies at the end of the 4th century, after which it remains relatively steady until the 7th century (Bes 2015, 6). During te 4th-5th century, production of PRSW steadily increases, while that of CRSW does not expand until the end of the 5th century. The Danube area became subject to frequent raids by several tribes, starting in the second half of the 4th century (Liebeschuetz 2015, p423-464). Population sizes decreased and, as a result, so did pottery imports.

The dataset shows that both the amount of ARSW sites and finds increase exponentially from the 3rd to the 4th century. From the 4th to the 5th century, the difference is smaller, with slightly more finds while the number of sites largely stays the same. During the same period, PRSW sees its number of sites doubling, and the increase in the number of sherds is even more dramatic: going from just over two hundred sherds in the 4th century to more than eleven hundred in the 5th century.

Something similar happens with CRSW, where the number of recorded 5th century sites is one and half times that of the 4th century. The number of sherds get multiplied by seven, although

as mentioned before much of that is probably indicative of the collection method around its production sites. The Danube area sees a reduction in sites in the 5th century when compared to the 4th century.

Here, the data matches the theory: finds in the Danube area decrease from the 4th century onward, when raids started. In addition, all three Red Slip Wares wares show an increase in production and exports in this period. For ARSW this starts in the 4th century, and for PRSW and CRSW in the 5th century. The ratio between the different wares is not quite the same: in the dataset, the number of 5th century ARSW sherds is three times as high as the number of PRSW and CRSW sherds in the same period. But in the values shown for the 5th century in table 8.1, the amount of CRSW sherds is much higher and the amount of PRSW sherds much lower than that of ARSW.

This is likely the result of data presentation, because in the dataset all sherds for one century are added together. Individual assemblages are usually not dated to a single century leading to sherds being assigned to two centuries, increasing the number of sherds per time period. In table 8.1 the data is represented per fifteen years and the amount of double values is probably much lower or even non-existant, leading to a lower number of sherds represented overall. The fact remains, however, that even when taking this into account the number of PRSW sherds in the table is higher than the number of ARSW sherds. But here it should be noted that table 8.1 is only concerned with the eastern Mediterranean, and the dataset also includes data from the western Mediterranean. This will significantly increase the number of ARSW sherds but not that of PRSW and CRSW sherds, leading to a different sherds ratio in the dataset as opposed to in table 8.1.

### 8.2.3. 6th-7th century

The 6th century saw production peaks for all three wares: for ARSW, PRSW and CRSW in the mid, early and late 6th century respectively (table 8.1). ARSW and PRSW show an additional peak in the early 7th century, but both wares are thought to have ceased production by the end of the 7th century (Bes 2015, 130). CRSW probably continued to be produced into the 8th century (Jackson *et al* 2012, 109). These 6th and especially 7th century peaks were mostly localised to the eastern Mediterranean, with multiple reasons -already described in paragraph 2.2- causing the amount of Red Slip Wares, and imported Roman wares in general, to decline in the west (Arthur 2008, 164). Raids in the Danube area continued, causing many cities to have become abandoned around 600 (Liebeschuetz 2015, p423-464).

The dataset does not break dates down to the extent that table 8.1 does, so short-tern variations are less visible. But it does show a 6th century peak in PRSW and CRSW exports. For ARSW, however, it shows a decline in both the amount of sherds and sites. In the 7th century, all wares are in decline, showing no sign of any production peaks. CRSW is recorded as having been produced into the 8th century, but this is based on scientific consensus that CRSW was

produced after 700 AD, not on independent dating of the sherds (Jackson *et al* 2012, 109). No Red Slip Ware sherds have been recorded in the Danube area for this period.

A 6th century production peak is confirmed in the dataset for PRSW and CRSW. A possible export peak in ARSW in the east, however, might be neutralized by the fact that less wares were exported to the western Mediterranean, leading to an overall decline in the amount of wares. Perhaps this is the reason why the amount of ARSW in the east increases again during this time, production centers needed to compensate for the loss of a western market and shipped their wares further east. In this period, imports in the Danube area have ceased entirely, following population impacts as a result of the frequent raids and perhaps also other social and economic factors.

## 8.3 Vessel form

There seem to be few literature available that analyses vessel forms. Hayes published a short explanation of the chronological development of vessel forms -something not discussed in this thesis- in which he mostly mentioned dishes and bowls being popular (Hayes 1972, 15-17). This is in accordance with the gathered data, almost all of the recorded vessel forms are either dishes or bowls. “Regular” dishes are the most common, followed by shallow bowls, flat-based dishes, and deep bowls. Plates, closed forms and lids are the least common.

Lids and closed forms are the only two forms which, on the basis of this dataset, can be said to have had a limited geographical span. Both are part of coarse wares, not fine wares, and are only present in ARSW. Being only a part of the ARSW vessel forms leaves them at a disadvantage to some of the other forms which were also produced by PRSW and/or CRSW, which would have had a higher number of vessel produced as a result. In addition, both ARSW closed forms and coarse wares (including lids and casseroles, the latter classified in the dataset under deep bowls) were only produced until the 3rd century (Hayes 1972, 17-18). This means production ended before the popularity and exports of ARSW increased in the 4th century and it was only distributed on a limited scale, mostly in the western Mediterranean.
All other vessel forms can be found in nearly all parts of the Empire, with areas in the eastern Mediterranean where they are absent most likely being the result of limited data collection of vessel forms in that area.

## 8.4. Decoration

Geometrical decoration is most common overall, with the other decoration categories (floral and botanical, animal and human and religious and mythical) being recorded in roughly equal amounts

Only one decorated CRSW sherd was recorded in the dataset, which correlates with CRSW mostly featuring rouletted decoration instead of stamps (Hayes 1972, 372). PRSW, however, is supposed to feature decoration similar to ARSW (Hayes 1972, 14, 324). Few decorated sherds are recorded for PRSW, which can be explained first and foremost due to there being less PRSW than ARSW sherds recorded overall. Second, most PRSW records are from the eastern

Mediterranen and are recorded from Bes 2015, where no data with regard to decoration was recorded (Bes 2015).

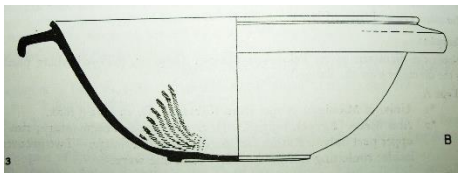


*Figure 8.2. Example of deep bowl form 91B. Source: Hayes 1972, 142.*

The least decorated forms are closed forms and deep bowls. This makes sense, since decoration on Red Slip Wares is most commonly found on the floor of vessels (Hayes 1972, p211, 217). For closed forms, the resulting lack of decoration is self evident. But this is logical for deep bowls too, since these are frequently small vessels, which have an equally small base. Even larger deep bowls like Hayes form 91B (figure 8.2) taper enough to only leave a possible artist with very limited work space (Hayes 1972, 140-142). For these two forms, decoration on the outside would make more sense, like the rouletting in figure 8.2 (as explained in paragraph 1.3, rouletting is not counted as geometric decoration for the purpose of this thesis).

There are substantial differences in the types of decoration used on different vessel forms, which the author cannot explain at this time based on the available dataset. It is possible that the differences have to do with the production date of the vessels: the popularity of different decoration categories shows differences over time (see below), and vessel forms do too. For example, Hayes mentions that flat-based dishes were popular in the 4$^{th}$ and 5$^{th}$ century (Hayes 1972, 15-16). Most flat-based dishes are ARSW, which during that time had as the most popular decoration categories geometrical and floral and botanical decoration (table 7.10). These are the two decoration categories most frequently used on flat-based dishes (table 7.4).

However, the most popular vessel forms -dishes and shallow bowls- were mostly likely manufactured throughout the production period of the Red Slip Wares, leading to their large numbers in comparison to some of the other more short-lived forms (for example, closed forms). If this is the case, the distinction between vessel forms used in this thesis will not clarify things much for these common forms and a different categorization will be needed, perhaps one looking at the individuals Hayes forms (Hayes 1972).

Chronological classification of decoration categories reveals that for ARSW, geometrical and floral and botanical decoration were the most common decoration categories from the start of production until the 5$^{th}$ century. During the 6$^{th}$ century, animal, human, religious and mythical scenes took over and they were the only decoration used in the 7$^{th}$ century. Developments in PRSW mirror these of ARSW, although only a few sherds with geometrical, animal and human decorations were recorded for PRSW. The rising popularity of religious and mythical motives from the 5$^{th}$ century onwards is not surprising. Most of the religious decoration consists of Christian scenes and symbols. Christianity, of course, becomes more and more common in the Roman Empire from the mid-4$^{th}$ century onwards after it became the state religion. In addition, the most frequently used symbols are cross-monograms, a Christian symbol whose use did not become popular until the 5$^{th}$ century (Hayes 1972, 287).

Decoration in general, however, only started to be used in greater quantities in the 4th century, and reached its peak in the 5th century. The number of decorated 7th century sherds were roughly equal to that of the 2nd and 3rd centuries for ARSW, and to that of the 4th century for PRSW.

# 9. Conclusion

The aim of this thesis was to create a comprehensive overview of different attributes of Red Slip Wares across the entire Roman Empire during the Late Roman period. This was reflected in the research question and in the subquestions:

**What was the spatial distribution of Red Slip Wares in the Roman Empire?**
**How do different time periods affect Red Slip Ware distribution patterns?**
**What is the spatial distribution of different Red Slip Ware vessel forms?**
**What influence do vessel form and time period have on the appearance of Red Slip Ware decoration?**

The Microsoft database created for the purposes of this thesis was very useful, the structure meant results could be filtered for all kinds of different attributes allowing for the creation of data overviews for very specific queries, not all of which have been used. A problem was the use of a multivalued field for the date, it could not be queried independently as a result and a detour had to be used to be able to query by date at all. Although entering data using this kind of field was very easy, a different method allowing easier use of queries would be better to use in the future. Perhaps individual columns using checkboxes for each date.
The mapping program, QGIS, also functioned well and was able to provide all of the visualizations necessary, although an attempt to use buffers to highlight towns within short range of bodies of water failed. Only a very limited amount of functions were used.

The dataset showed ARSW as the most popular ware during the Late Roman Period, followed by PRSW and CRSW. The latter had the most limited spatial distribution, with most sherds found in the eastern corner of the Mediterranean. PRSW was more widespread, with numerous finds in the western Mediterranean, the British Isles and the coastal areas of the Black Sea. Although its focus lay mostly in the coastal areas of the Aegean and, to a lesser extent, the eastern Mediterranean as a whole. ARSW exported its wares to the entire Mediterranean and beyond, with finds in the British Isles and along the coasts of both the Black Sea and the Red Sea. It is the only one of the three Red Slip Wares to have a presence in inland continental Europe, with sherds recorded in the Danube area, France, western Germany and the northern Netherlands. These results were largely within expectations, although interpretations were sometimes hindered by a lack of recorded sites in key areas like inland Asia Minor and the Black Sea coast. In both areas, more archaeological evidence might perhaps already exist but they were not accessible while researching for this thesis, possibly as a result of a language barrier.

ARSW shows a slight preference towards exporting to the western Mediterranean in the 2$^{nd}$ century. Its spatial distribution is greatest in the 4$^{th}$ and 5$^{th}$ centuries, with its reach declining in the 6$^{th}$ century. For PRSW and CRSW, the 6$^{th}$ century is when spatial distribution is at a maximum. All three wares show decline in the 7$^{th}$ century and are exported to fewer areas. More research could be done about the end of Red Slip Ware production. The manufacture of ARSW and PRSW ceases in the 7$^{th}$ century, but the reasons why are still unclear. CRSW

production continues, but it is not known for how long and what forms were produced during these later periods. In addition, it is suspected that there was more than one CRSW production site, but others have yet to be identified. If the lack of central Turkish sites is indeed a result of a lack of research rather than as a lack of readily available publications, perhaps more research here would be helpful here. Not only to possibly identify more CRSW production sites, but also to shed light on Red Slip Ware distribution in that area, where records for only a few sites have been recorded in this thesis.

There does not appear to be a difference in spatial distribution for vessel forms other than lids and closed forms, all the remaining forms are found throughout the Empire. The more limited spread of these two categories can be explained by them only being produced as ARSW and up to the 3rd century, before Red Slip Wares became popular. Few information about vessel form was available in this thesis for the eastern Mediterranean, adding this information would be tremendously helpful for analysis since most areas in the east only have very few sites and sherds with recorded information about vessel form. As a result, barely any conclusions can be made about the spatial distribution of vessel forms in the eastern Mediterranean. Data from the western Mediterranean is sparse too, but is of a useable quantity.

The same problem hindered analysis for decoration: decoration was only recorded for a small percentage of the total dataset, resulting in only mostly western data from ARSW being usable for multiple types of analysis regarding decoration. Vessel form was not recorded in the database for SRSW and as a result analysing whether or not there was a correlation between vessel form and decoration category was not possible for SRSW. This data is available, however, and adding it to the dataset should not only enable more analysis on decoration, but also on the frequency of SRSW vessel forms itself which might differ substantially from the other Red Slip Wares. And if data on decoration could be added for other sites in this dataset too, a more useful spatial analysis could be made regarding decoration.

In addition, although analysis on vessel form shows several differences when combining vessel form and decoration type, there is currently not much of an explanation for this. There might be a possible correlation with time periods. Geometrical, floral and botanical decoration are popular up to and including the 5th century for ARSW, after which religious, mythical, animal and human motives take their place. In order to study a potential correlation, vessel forms would need to be split into smaller categories based on date. This might show that certain decoration categories are more common on specific forms, because both were popular during the same time period.

## Abstract

Red Slip Wares were the most common fine ware during the Late Roman Period. A comprehensive overview of different attributes across the entire Roman Empire has been lacking, with most research focusing only on pottery type -and sometimes dates as well- in a smaller area. The whole Roman Empire was interconnected and as such any traded goods cannot be seperated from the Mediterranean-wide trade networks, leading to a need to pool research of Red Slip Wares to obtain an overview of the entire area. Research regarding vessel form and decoration has been especially limited.

Different previous spatial studies of Red Slip Wares over smaller areas were combined and supplemented with extra data from other papers. All Red Slip Wares were mostly limited to coastal regions. African Red Slip Ware (ARSW) was used in all areas of the Roman Empire, and was also distributed farther inland. Use of Phocaean Red Slip Ware (PRSW) was limited to the Mediterranean, with a focus on the eastern Mediterranean and in particular the coastal region of the Aegaean. Cypriot Red Slip Ware (CRSW) is almost exclusively found in the eastern Mediterranean, with the highest numbers being recorded on Cyprus and in Israel and Palestine.

Production peaks for ARSW are in the 4$^{th}$ and 5$^{th}$ century. Those for PRSW and CRSW are in the 5$^{th}$ and 6$^{th}$ century, while those for Sagalassos Red Slip Ware (SRSW) are in the 2$^{nd}$ and 3$^{rd}$ century. Spatial distribution is most wide-spread in the 4$^{th}$ and 5$^{th}$ centuries, the 7$^{th}$ century showing a reduction in the popularity of all Red Slip Wares.

Dishes and shallow bowls were the most popular vessel forms. All vessel forms were used throughout most or all areas of the Roman Empire, with the exception of closed forms and lids which were limited to the western Mediterranean.

No spatial correlation could be found for decoration. Geometrical, floral and botanical decoration was the most common in ARSW from the 2$^{nd}$ to 5$^{th}$ century AD, with animal, human, religious and mythical decoration being the most popular in the 6$^{th}$ century. Geometric decoration is the most common on SRSW throughout its manufacturing period.

# Samenvatting

Red Slip Wares waren de meest gebruikte soorten fijn aardewerk gedurende de Laatromeinse tijd. Een uitgebreid overzicht van de verschillende attributen hiervan over het gehele Romeinse Rijk is tot nu toe achterwege gebleven. De meeste onderzoeken focussen slechts op het type aardewerk (en soms ook op datum) in een kleiner gebied.

Het gehele Romeinse Rijk was onderling verbonden en daardoor kunnen goederen niet van het Middelandse Zee-brede handelsnetwerk losgemaakt worden. Dit leidt tot een noodzaak om onderzoeken over Red Slip Wares te verenigen tot een overzicht van het complete gebied. Onderzoek aangaande de vorm van het aardewerk en vooral ook de decoratie is schaars.

Verschillende ruimtelijke onderzoeken over Red Slip Wares in kleinere gebieden werden gecombineerd en aangevuld met data van andere onderzoeken. Alle Red Slip Wares waren vooral beperkt tot kustgebieden. African Red Slip Ware (ARSW) werd gebruikt in alle gebieden van het Romeinse Rijk en werd ook verder het binnenland in getransporteerd. Phocaean Red Slip Ware (PRSW) beperkte zich vooral tot het Middellandse Zeegebied, met een focus op het oostelijke deel en in het bijzonder de kustregio van de Egeïsche Zee. Cypriot Red Slip Ware (CRSW) is bijna alleen in het oostelijke Middellandse Zeegebied gevonden, de hoogste aantallen zijn gevonden op Cyprus en in Israel en Palestina.

Het hoogtepunt van de productie van ARSW was in the 4$^{e}$ en 5$^{e}$ eeuw. Die van PRSW en CRSW lag in de 5$^{e}$ en 6$^{e}$ eeuw, terwijl die van Sagalassos Red Slip Ware (SRSW) in de 2$^{e}$ en 3$^{e}$ eeuw lag. Ruimtelijke distributie is het grootst in de 4$^{e}$ en 5$^{e}$ eeuw, in de 7$^{e}$ eeuw is er een daling in de populariteit van alle Red Slip Wares te zien.

Schalen en ondiepe kommen en  waren de populairste vormen. Alle vormen werden in de meeste of alle gebieden van het Romeinse Rijk, met uitzondering van dichte vormen en deksels. Deze werden alleen in het westellijke Middellandse Zeegebied gebruikt.

Er kon geen ruimtelijke correlatie gevonden worden voor decoratie. Geometrische decoratie en decoratie met bloemen en andere botanische motieven werd het meest gebruikt in ARSW van de 2$^{e}$ tot en met de 5$^{e}$ eeuw. Decoratie met dieren of mensen en met religieuze of mythische motieven was het populairst in de 6$^{e}$ eeuw. Geometrische decoratie wordt op SRSW gedurende de gehele productieperiode het meest gebruikt.

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| Table 7.13. Percentage of sherds with recorded decoration per century AD. Data for PRSW is left out because of the low number of sherds and small differences between the percentages. | 39 |

# Appendices

## Appendix A: maps

High-quality digital versions of the maps can be accessed via the following link: *https://tinyurl.com/RedSlipWares***.** Maps are located in the eponymous folder. The original maps loaded into QGIS are available under the folder "QGIS files". When opened it is possible to zoom in on areas with clustered data for which the scale of the maps here is too large in order for them to be displayed seperately. It should be noted that due to the file format they are stored in, they can only be opened in QGIS.

The source of the used maps is *www.naturalearthdata.com*, for all maps the resolution 1:10m was used. The following maps were used in this thesis: 'Natural Earth II with Shaded Relief, Water, and Drainages'; 'Lakes + Reservoirs'; 'Rivers + lake centerlines' and 'Rivers + lake centerlines: Europe supplement'.

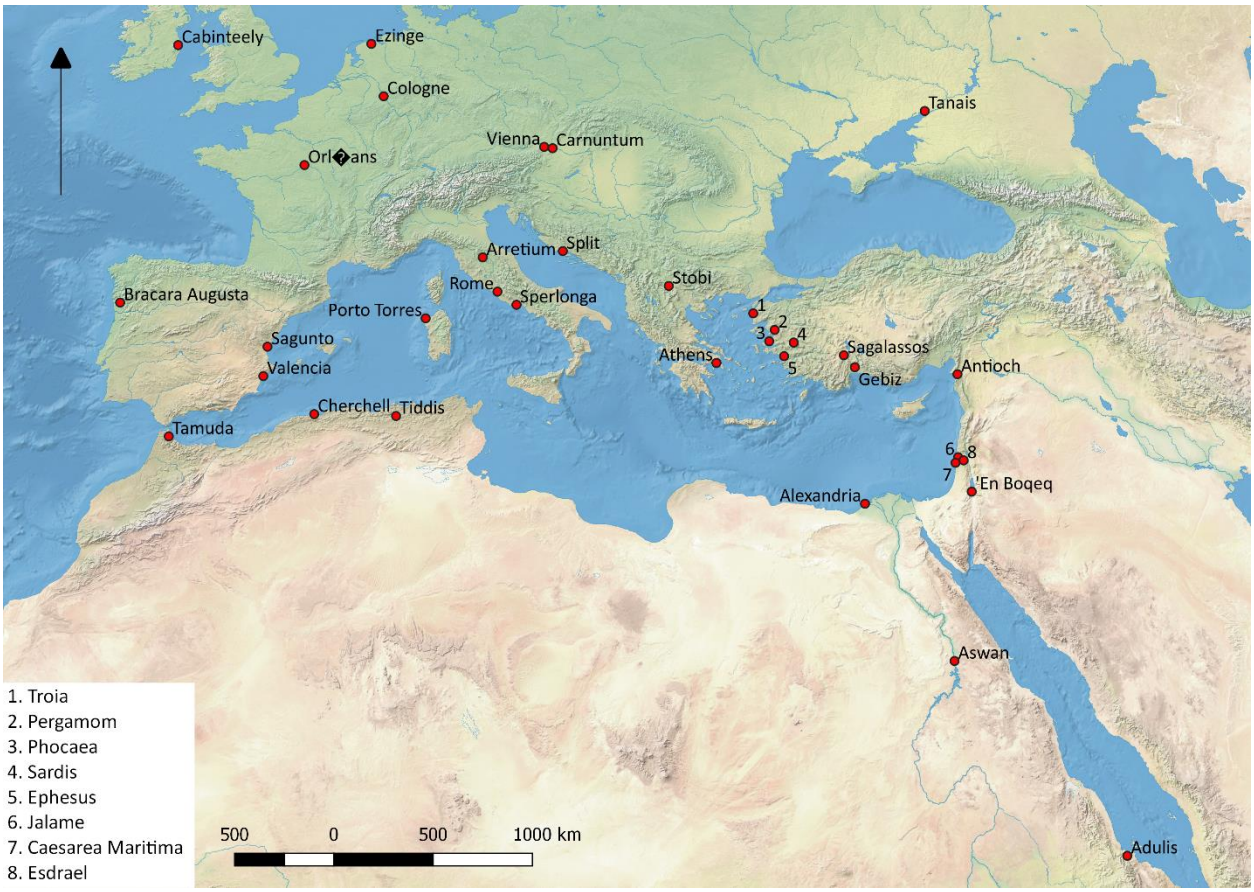


*Figure 1.1. Map of sites mentioned in the text*

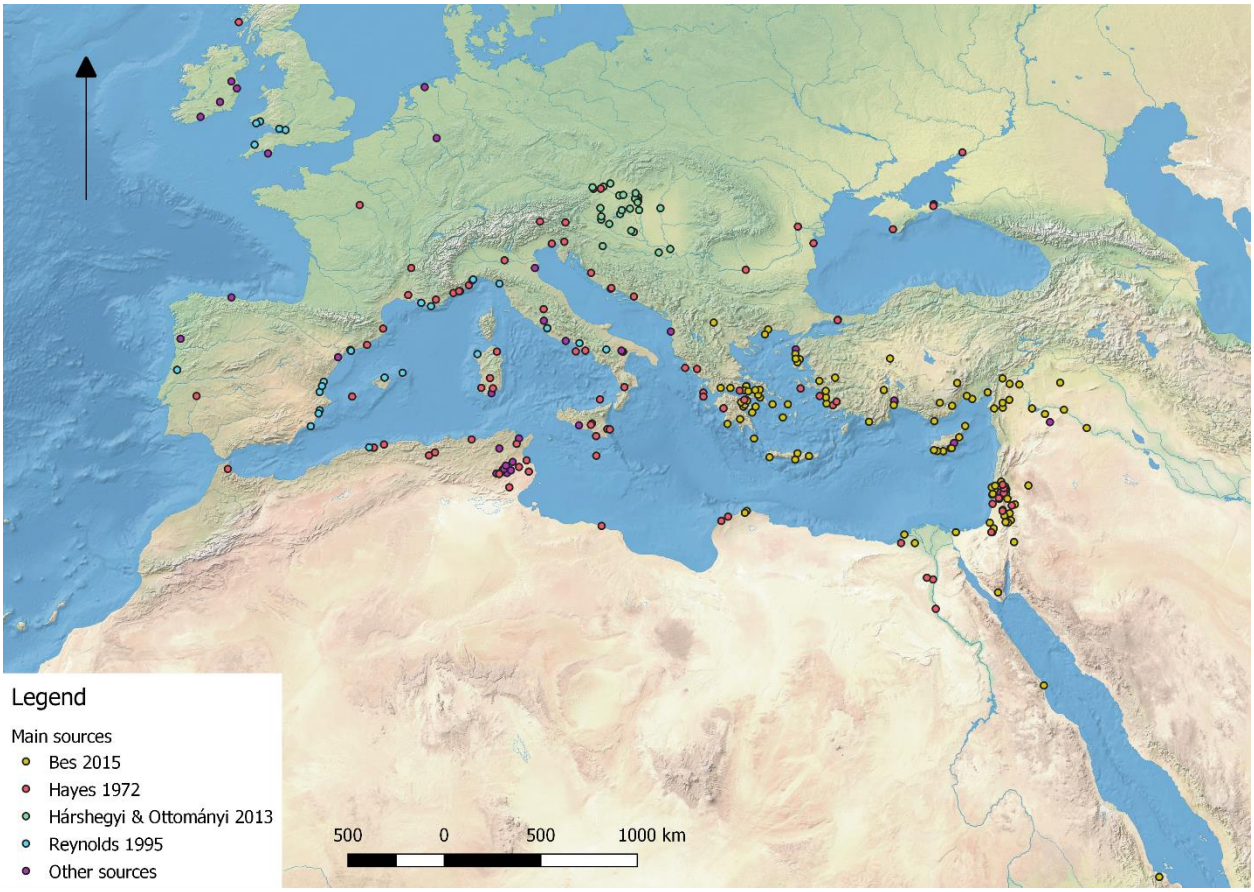


*Figure 1.4. Sources used for recording sherds, displayed per town.*

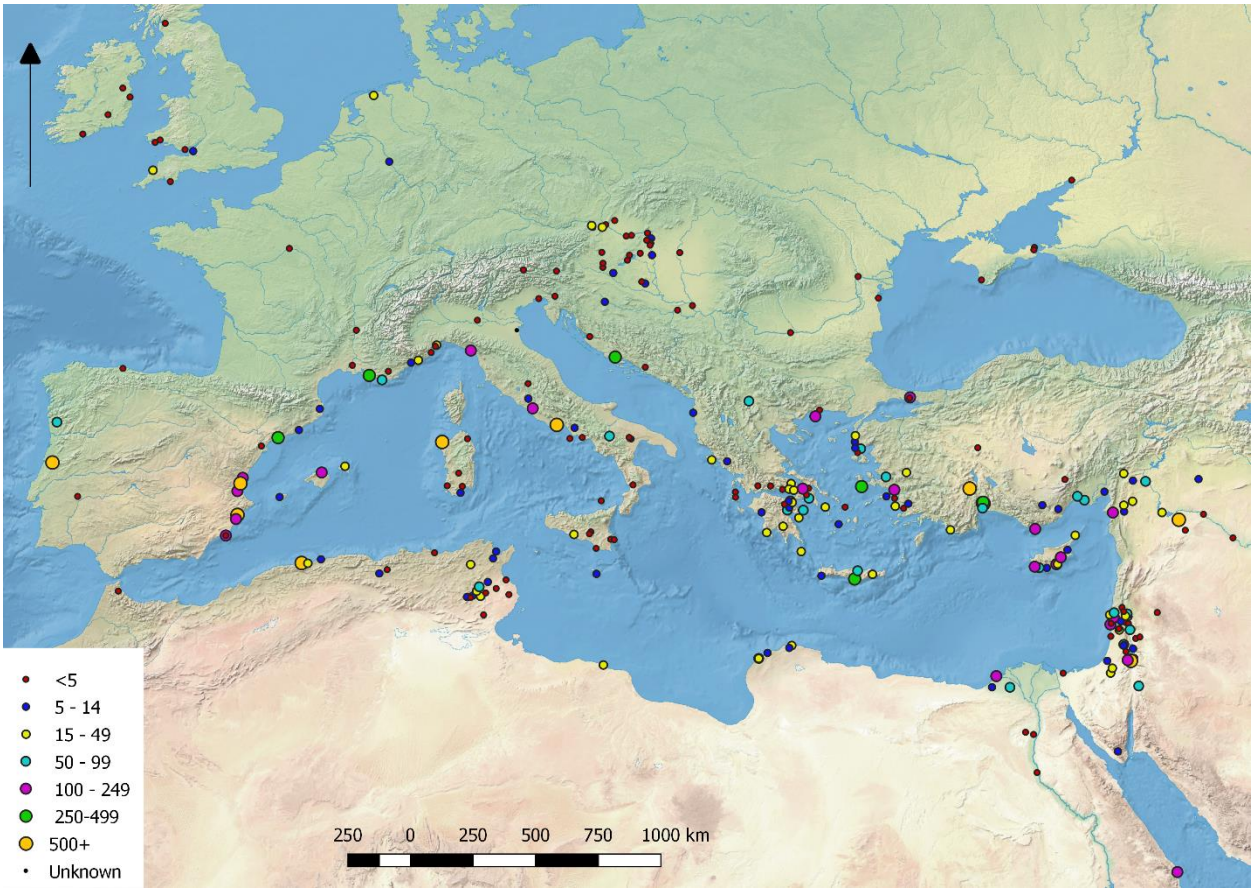


*Figure 3.1. Map representing the total number of sherds and vessels recorded in the database.*

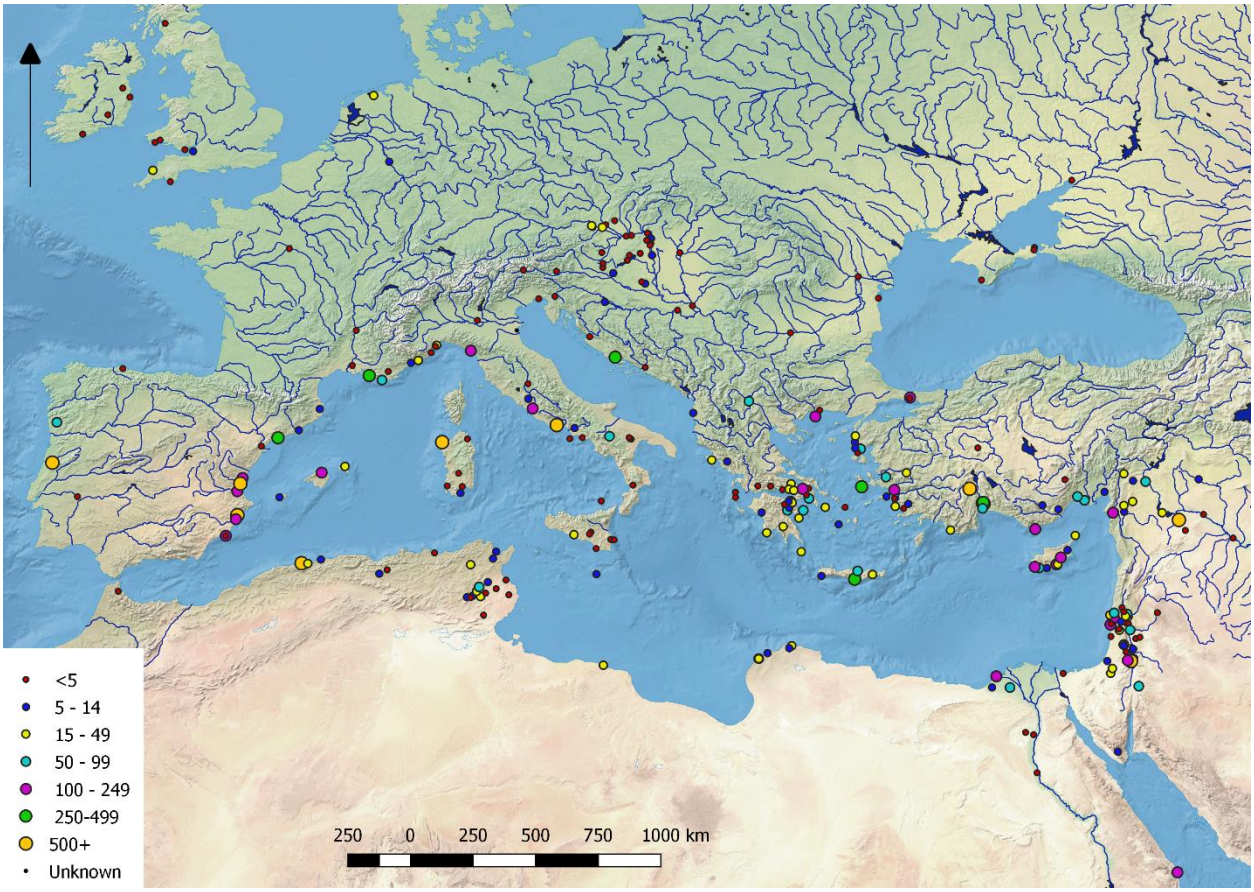


*Figure 3.2. Map representing the total number of sherds and vessels recorded in the database, highlighting rivers.*

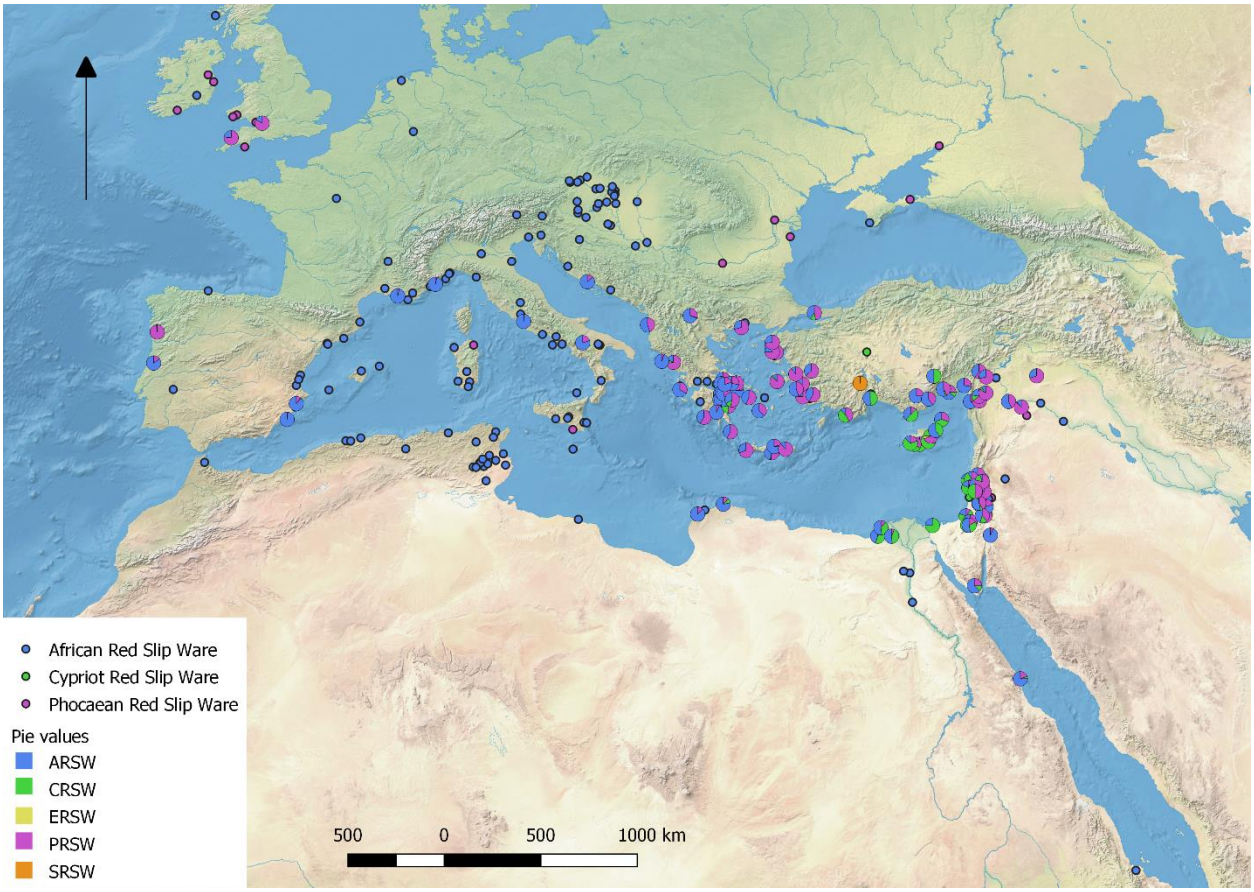


*Figure 4.1. Map showing the spread of the different wares. In case there were multiple pottery types found on a single site, the percentages of the number of sherds and vessels of the different Red Slip Wares are represented in pie charts.*

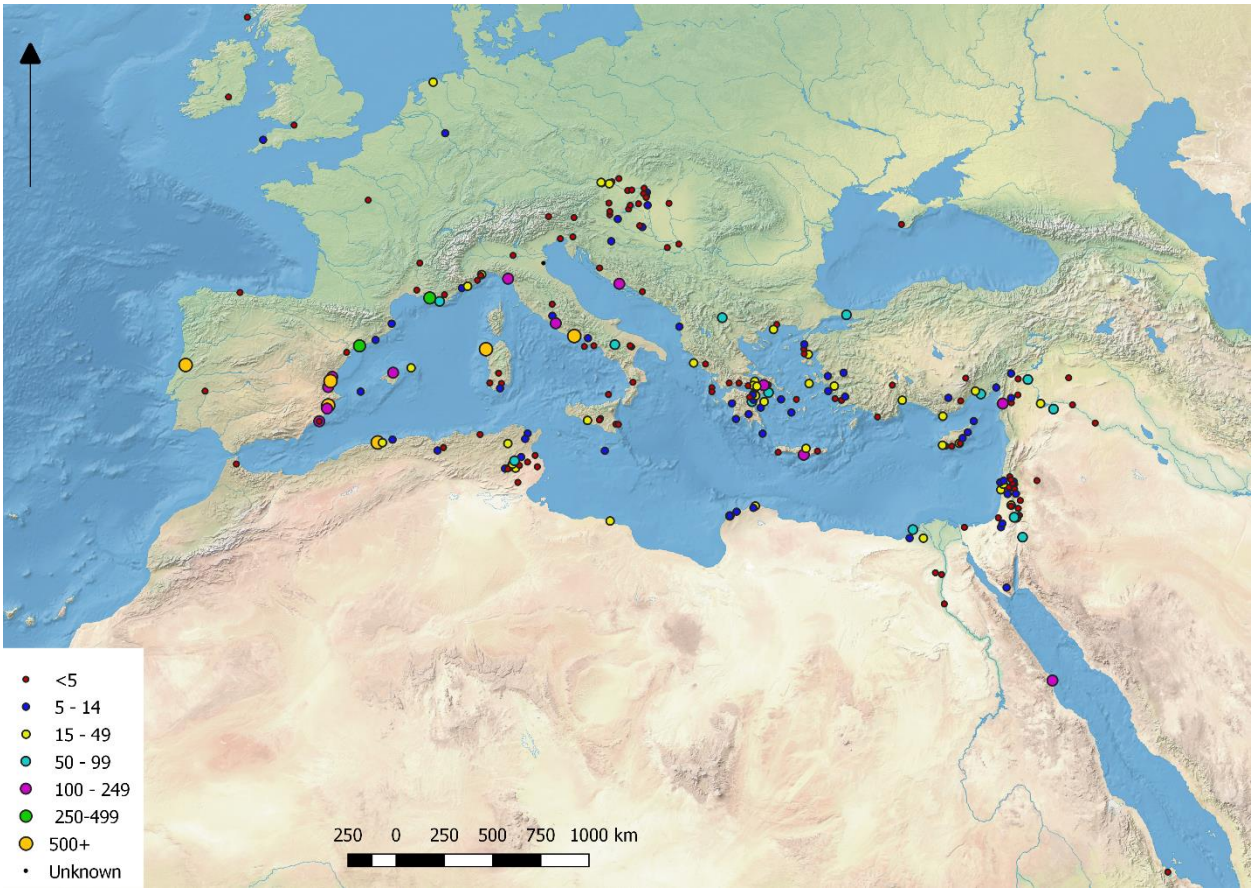


*Figure 4.2. Map representing the amount of ARSW sherds and vessels per site*

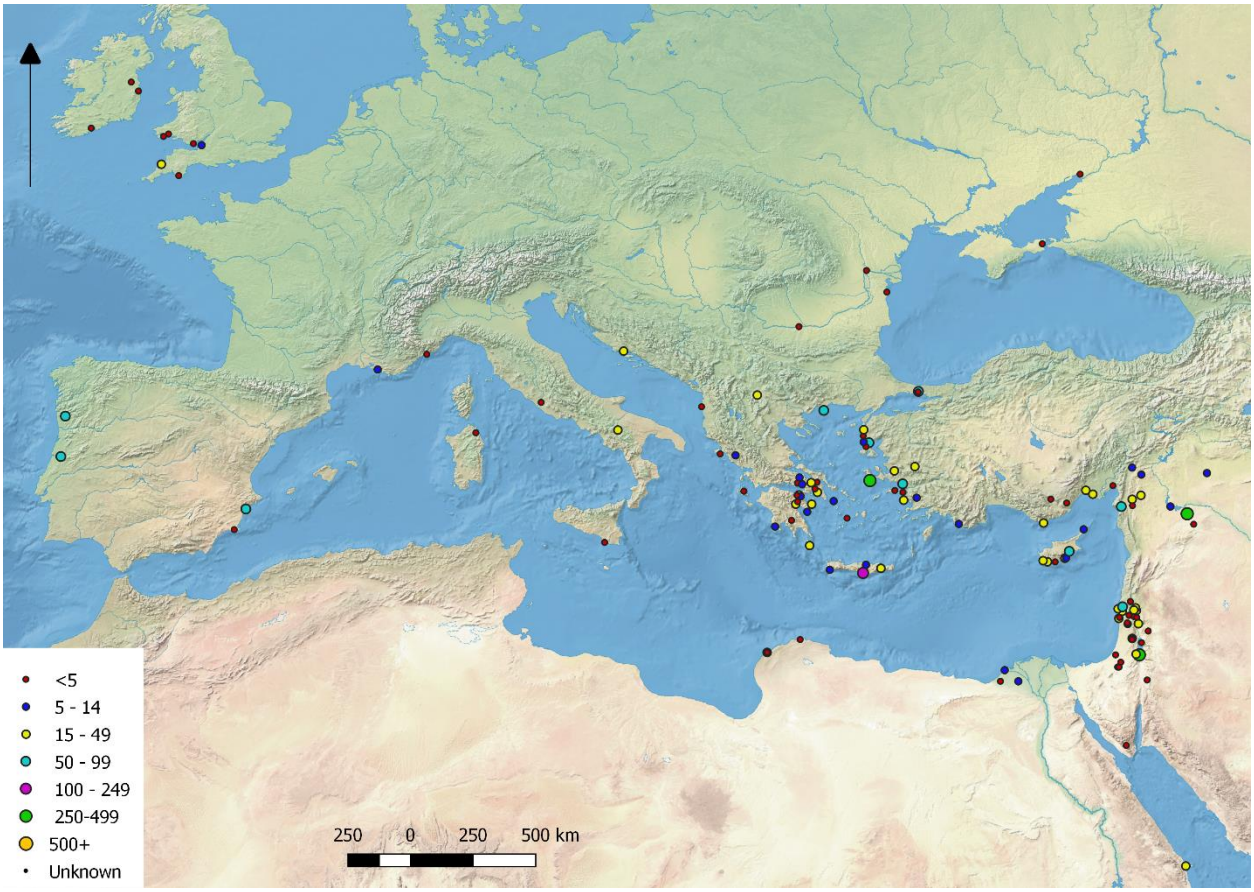


*Figure 4.3. Map representing the amount of PRSW sherds and vessels per site*

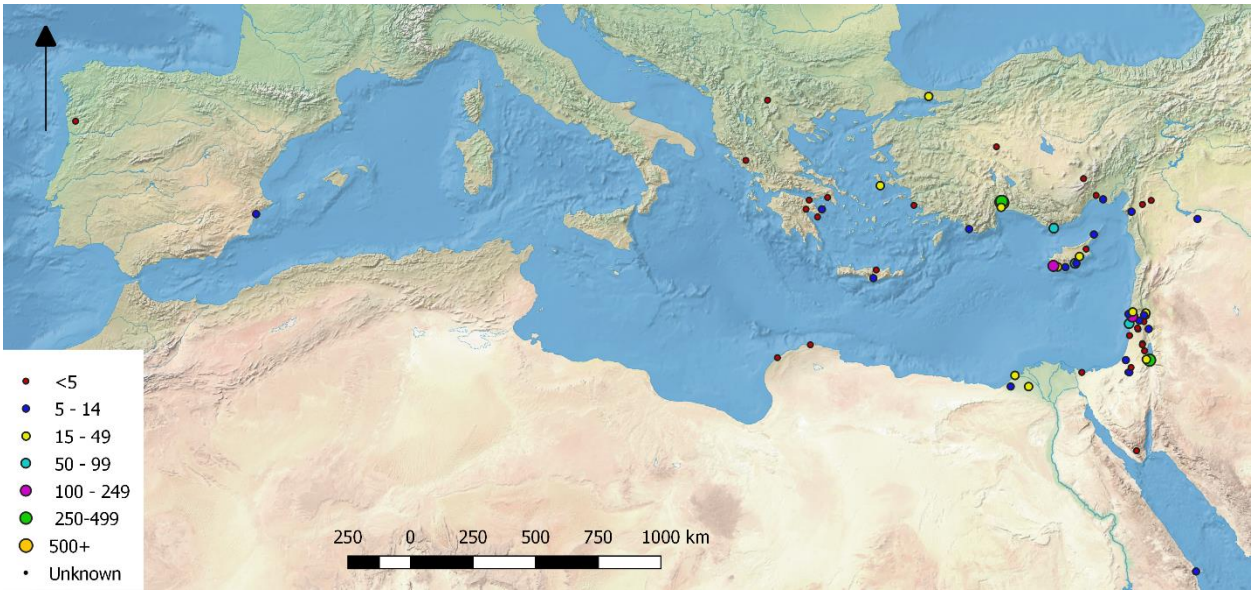


*Figure 4.4. Map representing the amount of CRSW sherds and vessels per site*

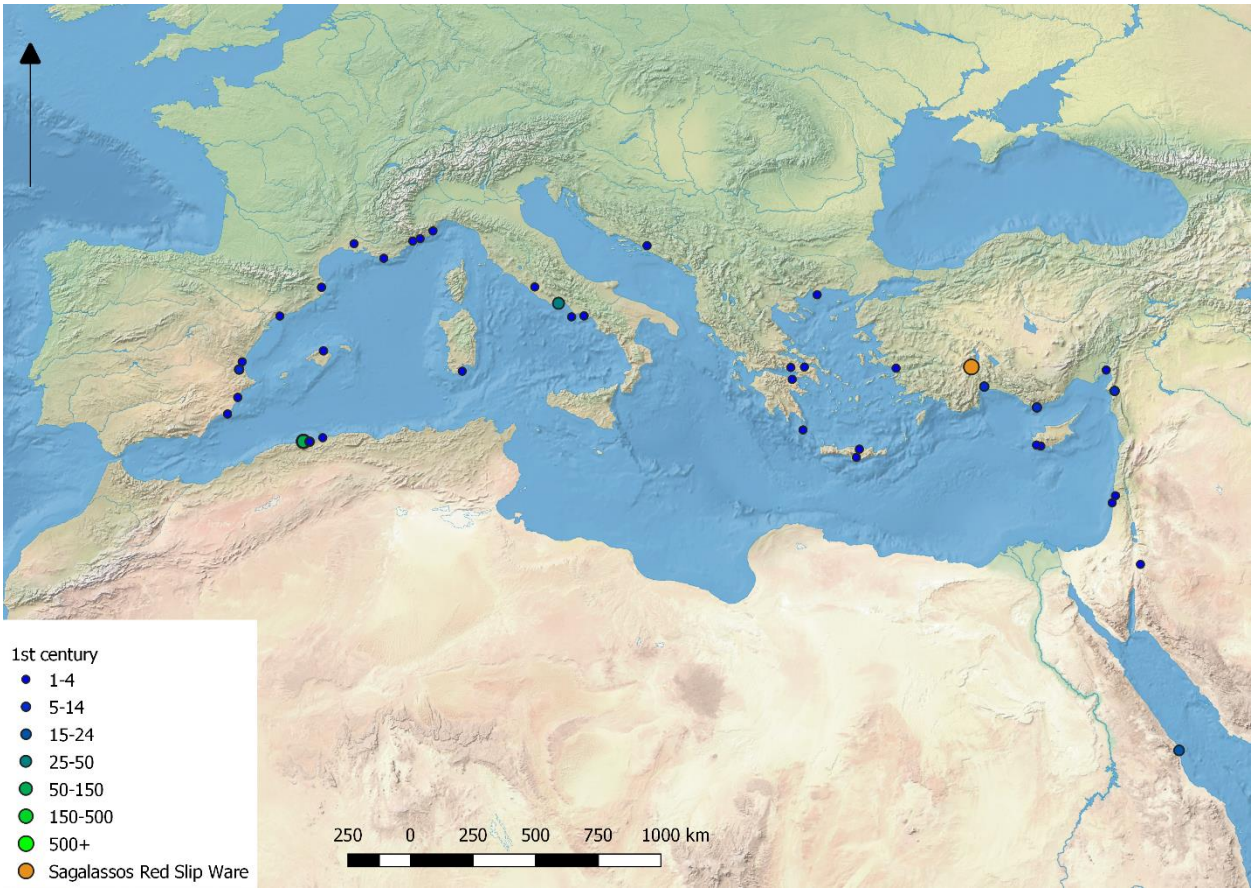


*Figure 5.1. Map representing the amount of sherds and vessels of the Red Slip Wares that can be dated to the 1st century.*

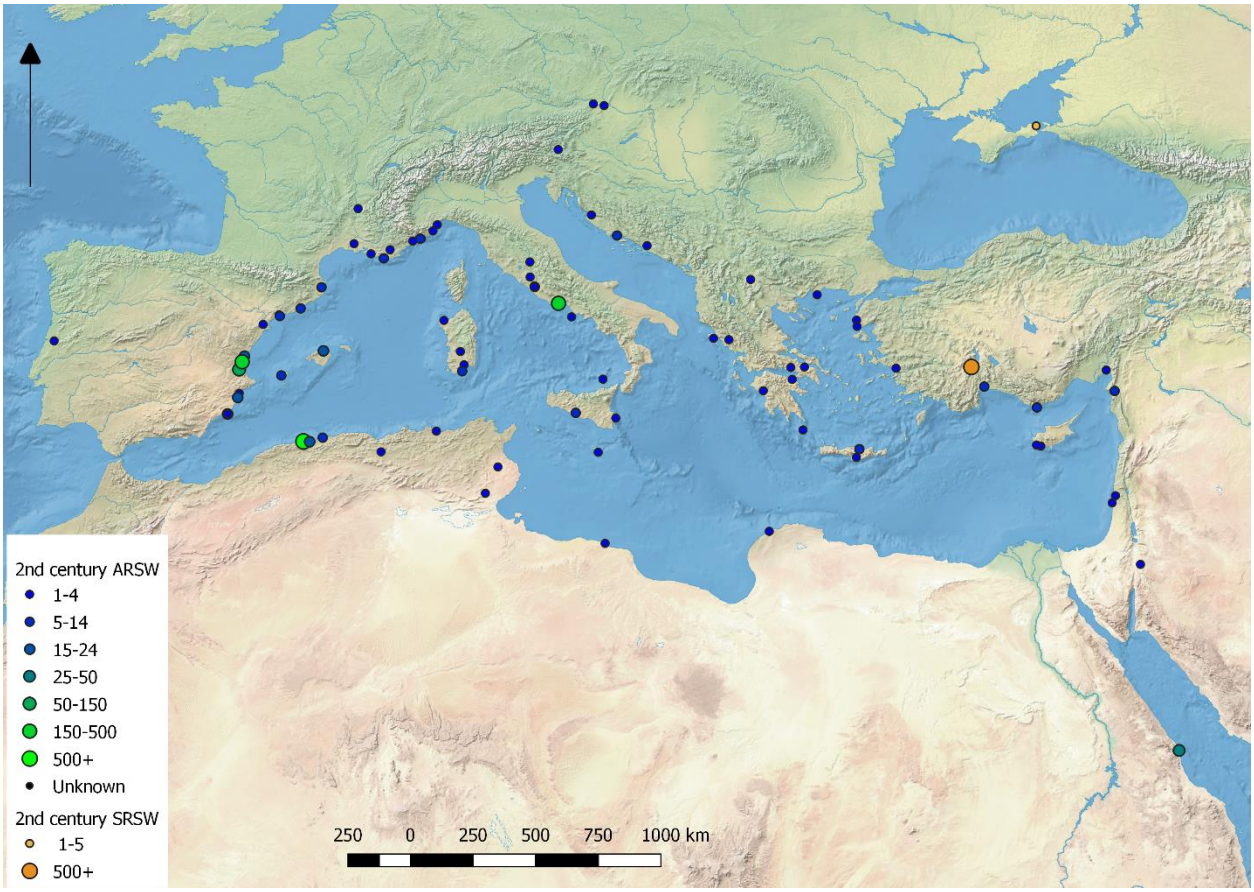


*Figure 5.2. Map representing the amount of sherds and vessels of the Red Slip Wares that can be dated to the 2nd century.*

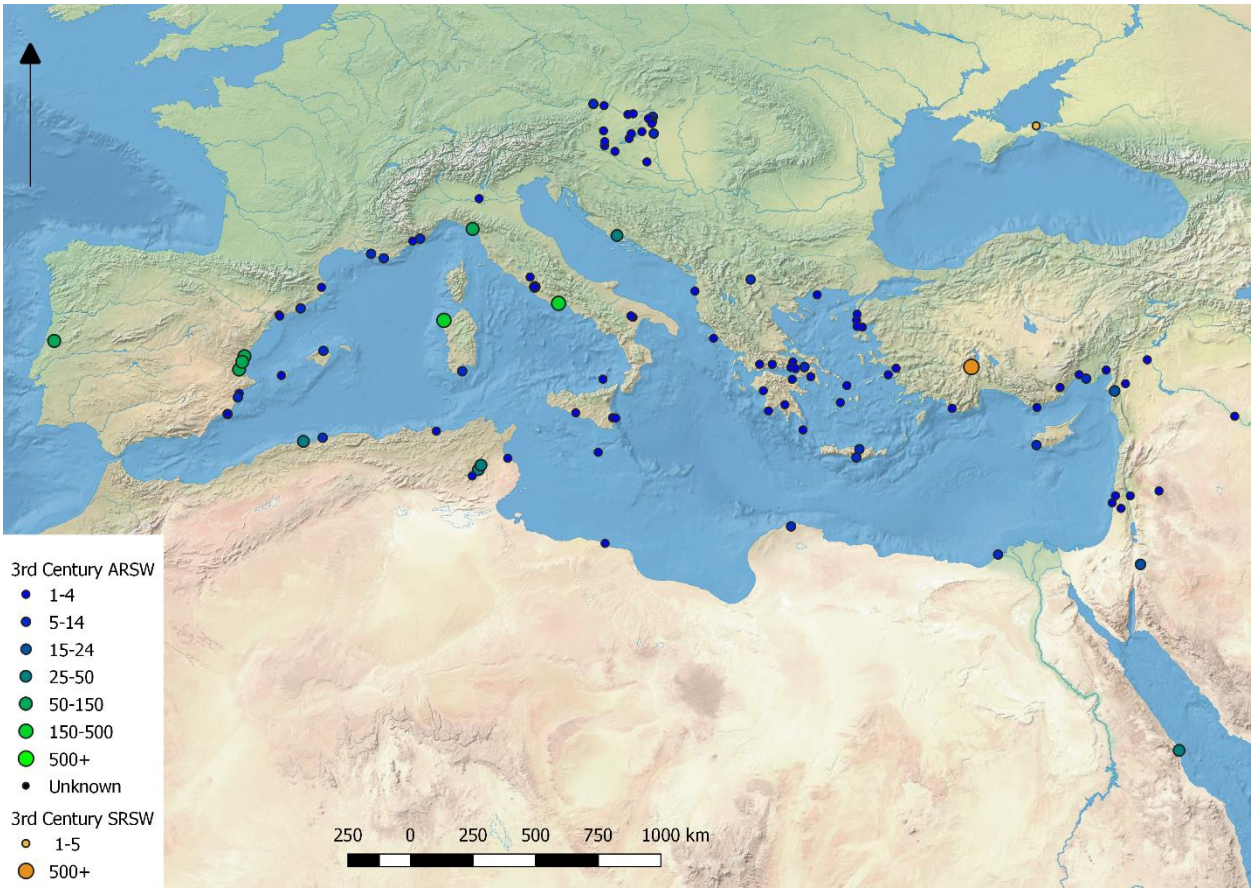


*Figure 5.3. Map representing the amount of sherds and vessels of the Red Slip Wares that can be dated to the 3rd century.*

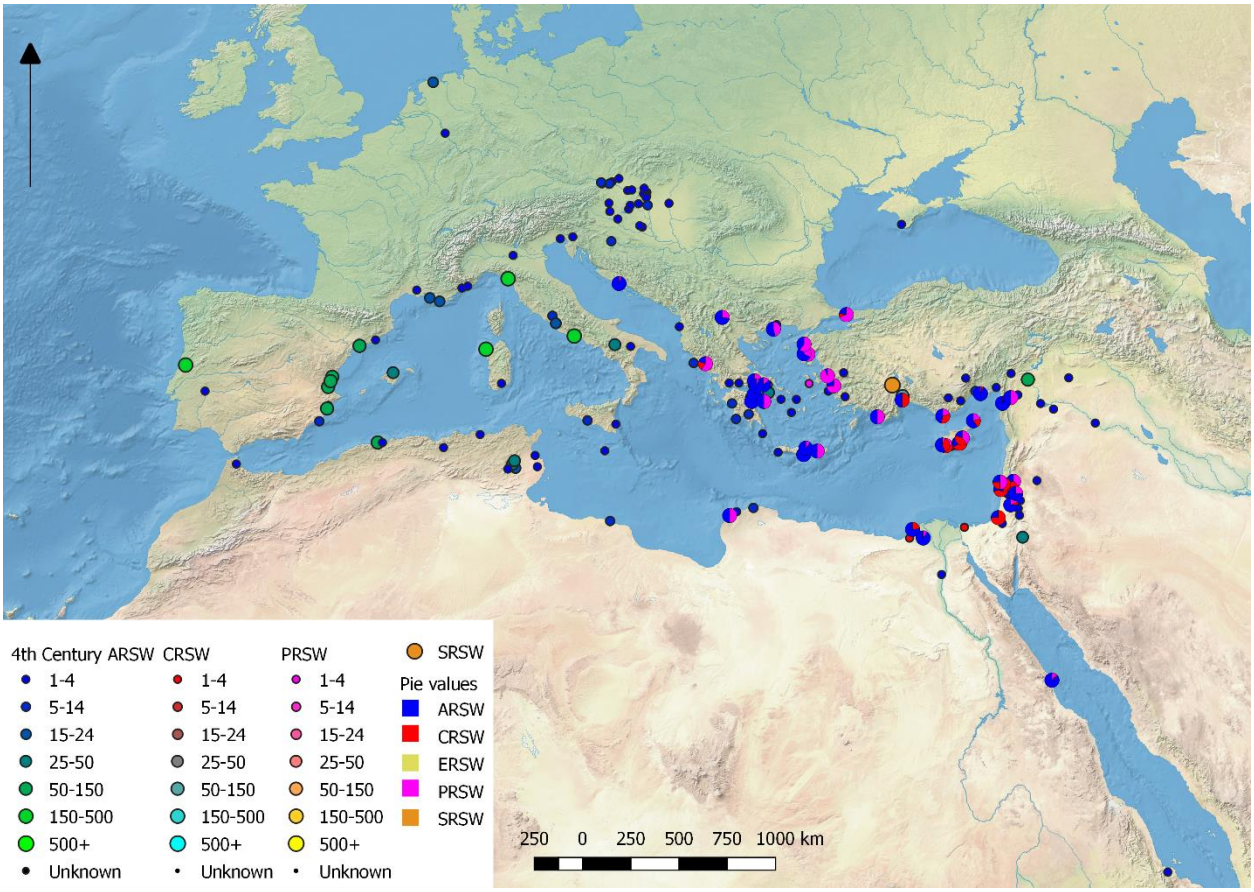


*Figure 5.4. Map representing the amount of sherds and vessels of the Red Slip Wares that can be dated to the 4th century.*

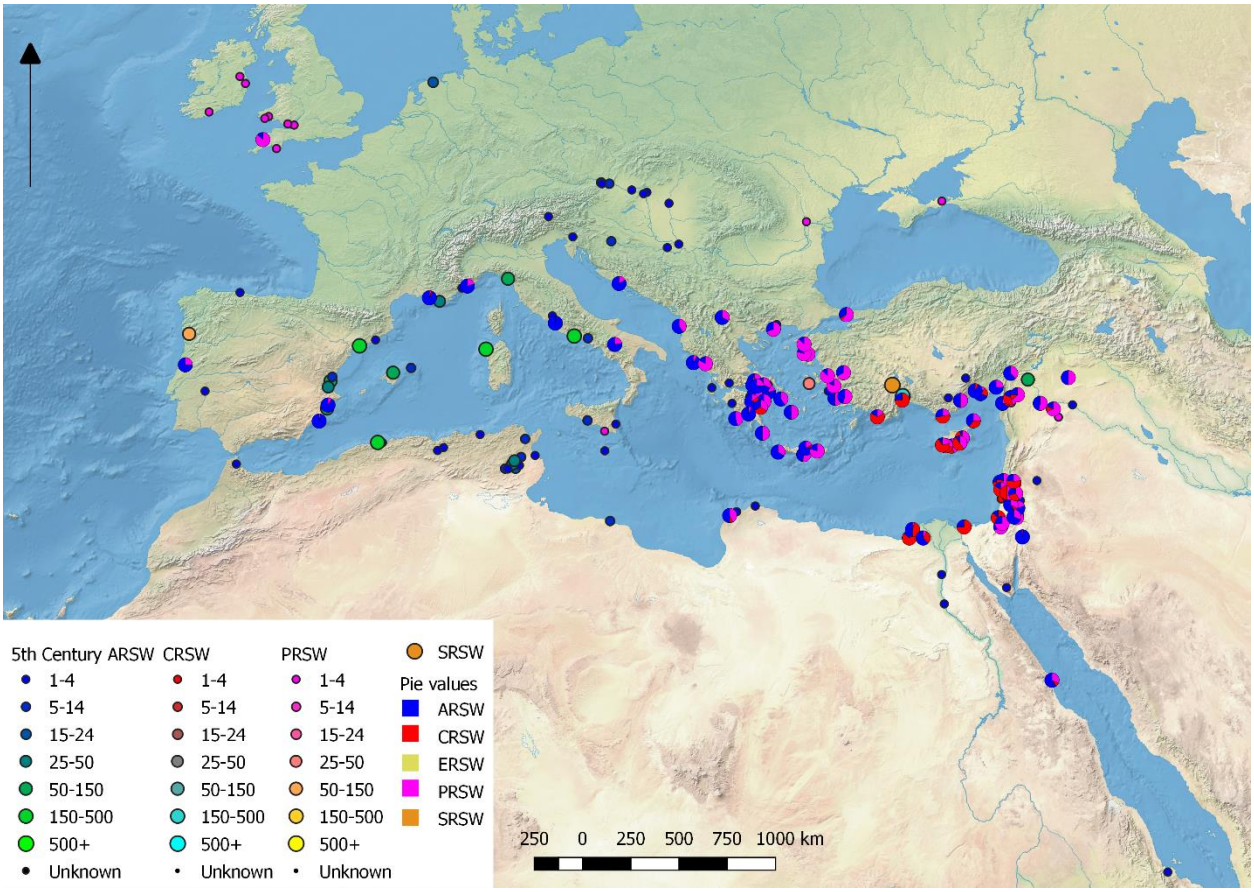


*Figure 5.5. Map representing the amount of sherds and vessels of the Red Slip Wares that can be dated to the 5th century.*

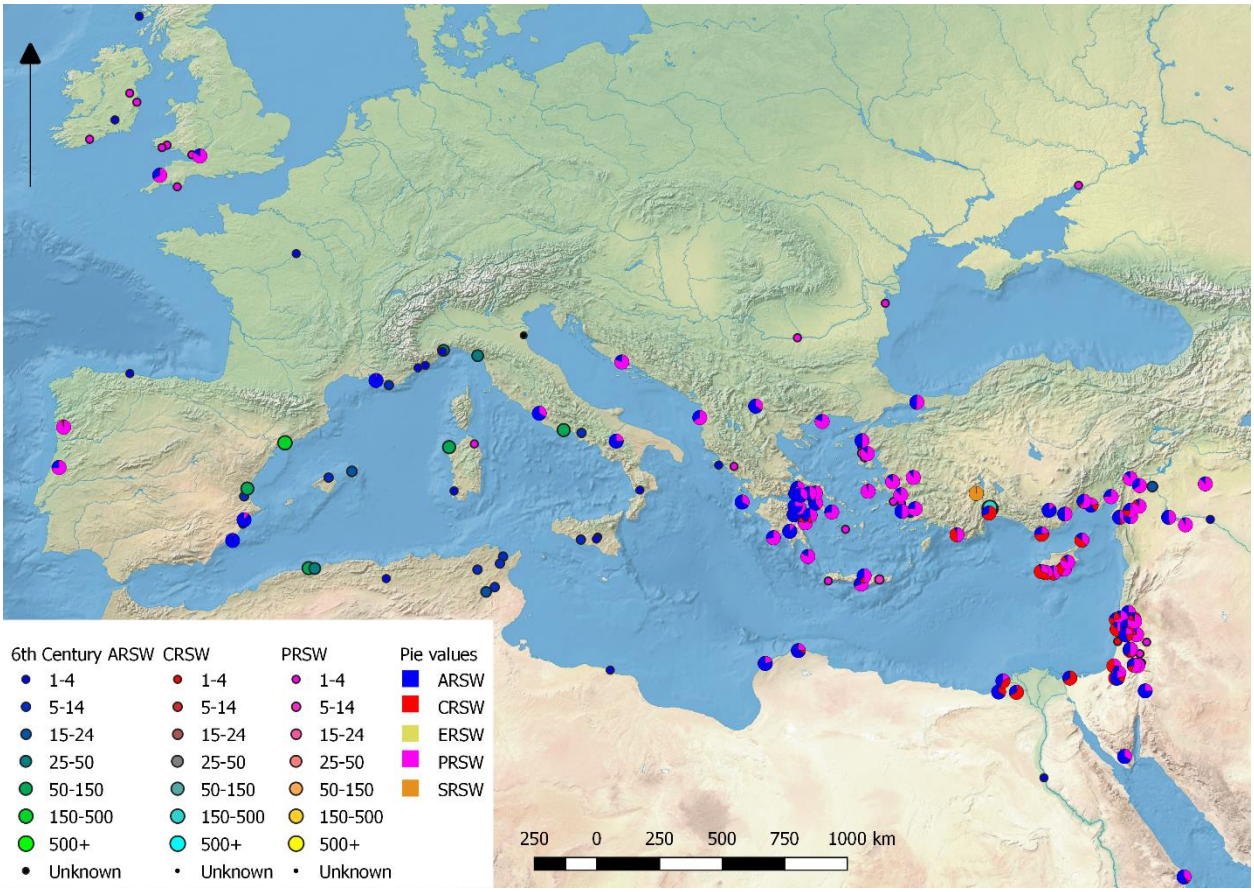


*Figure 5.6. Map representing the amount of sherds and vessels of the Red Slip Wares that can be dated to the 6th century.*

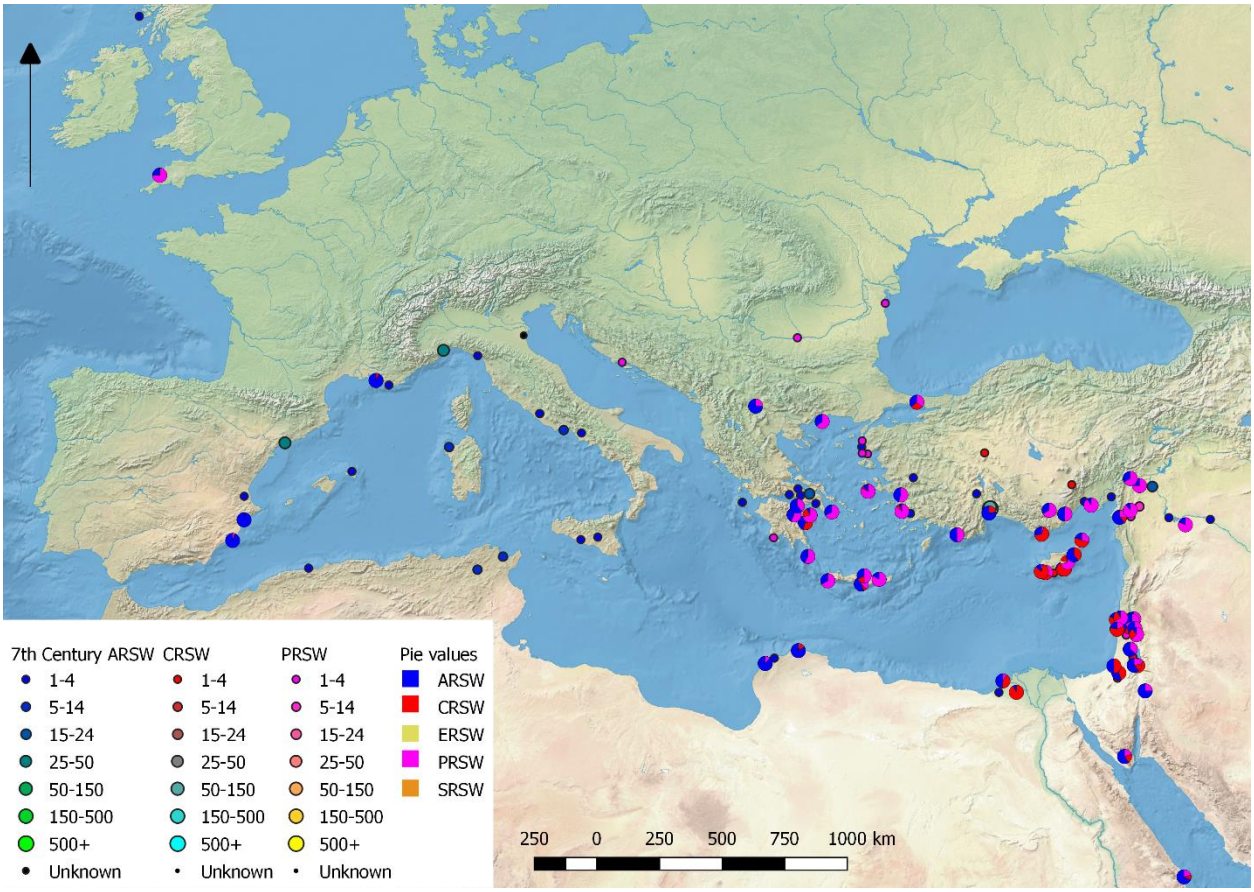


*Figure 5.7. Map representing the amount of sherds and vessels of the Red Slip Wares that can be dated to the 7th century.*

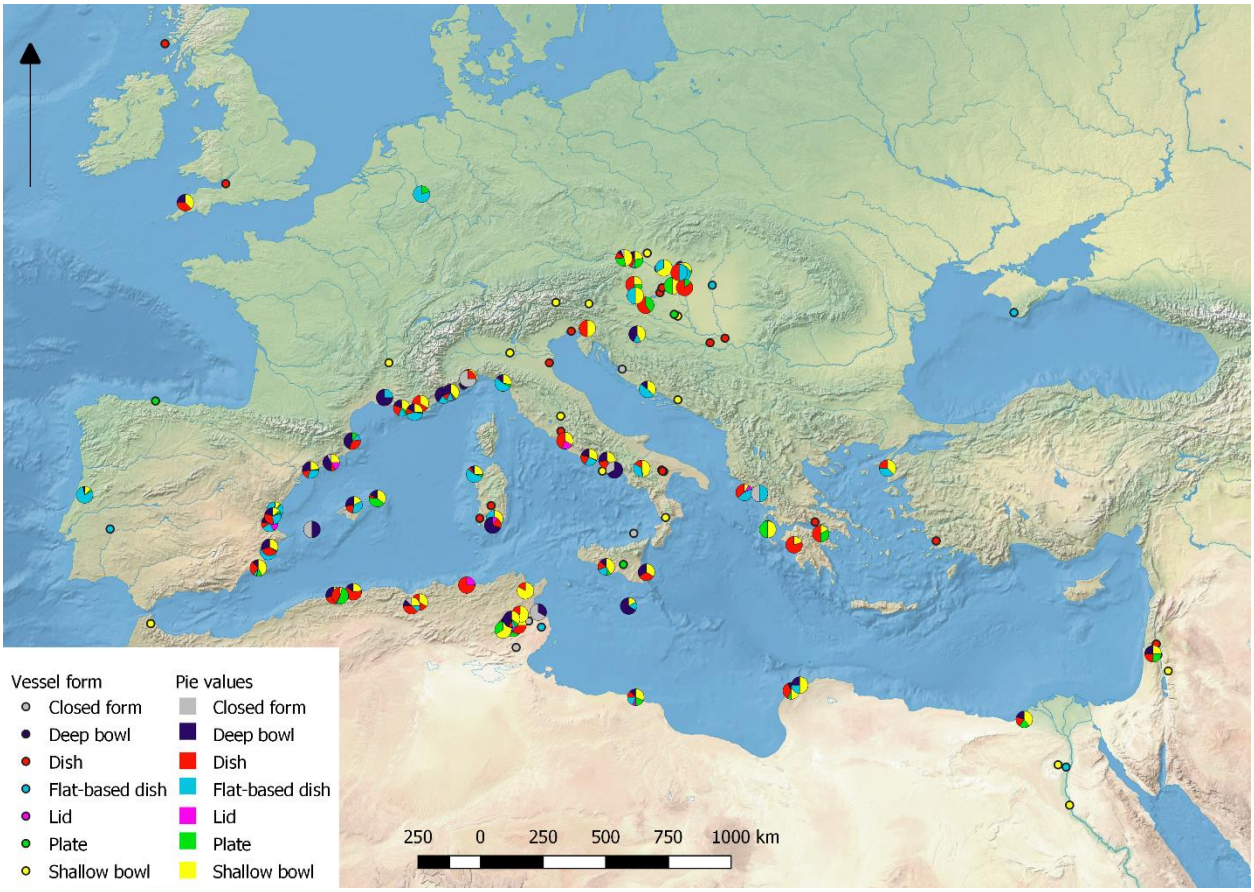


*Figure 6.2. Map showing the spread of the different vessel forms for ARSW.*

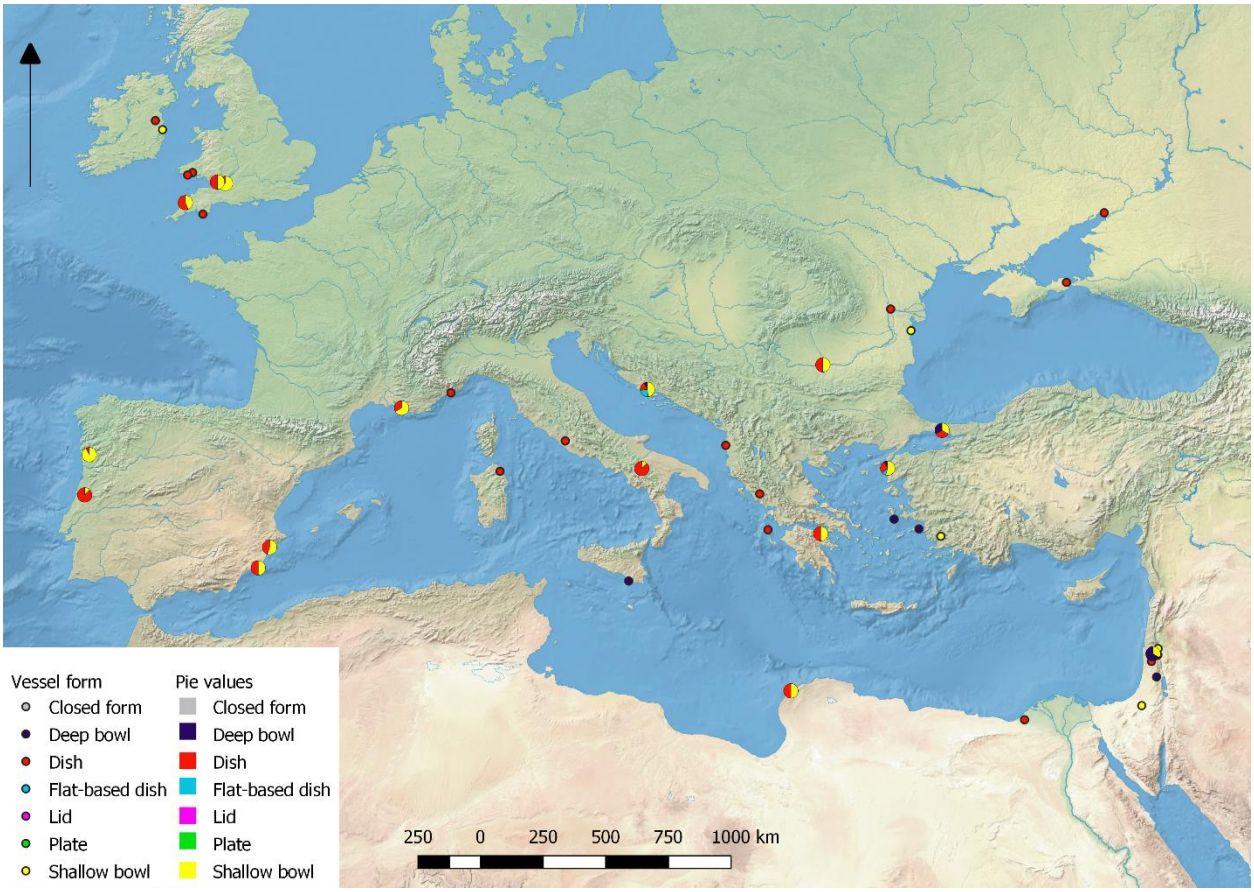


*Figure 6.3. Map showing the spread of the different vessel forms for PRSW.*

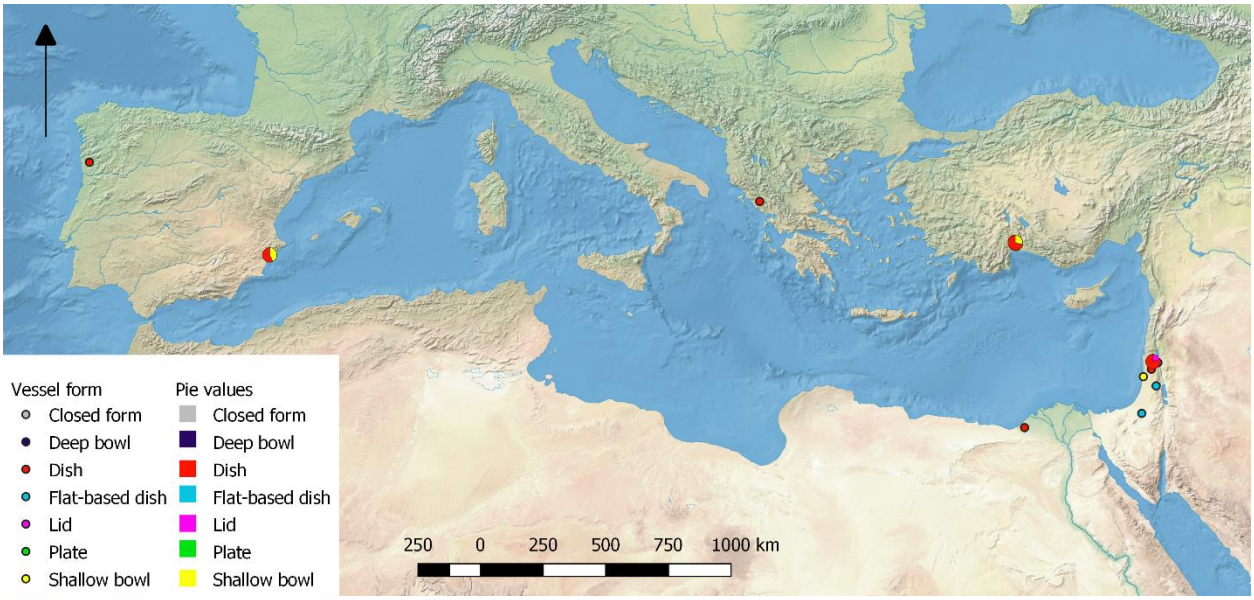


*Figure 6.4. Map showing the spread of the different vessel forms for CRSW.*

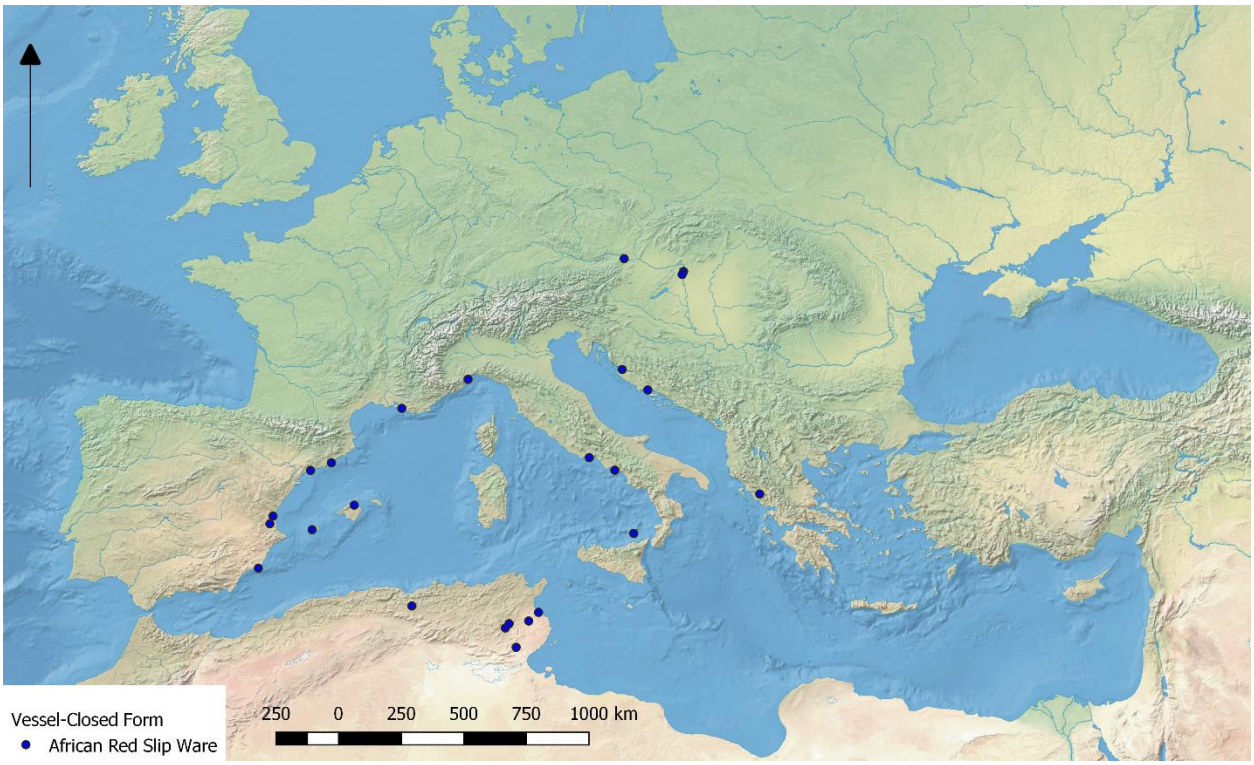


*Figure 6.5. Map showing the spread of closed forms. All closed forms belong to ARSW.*

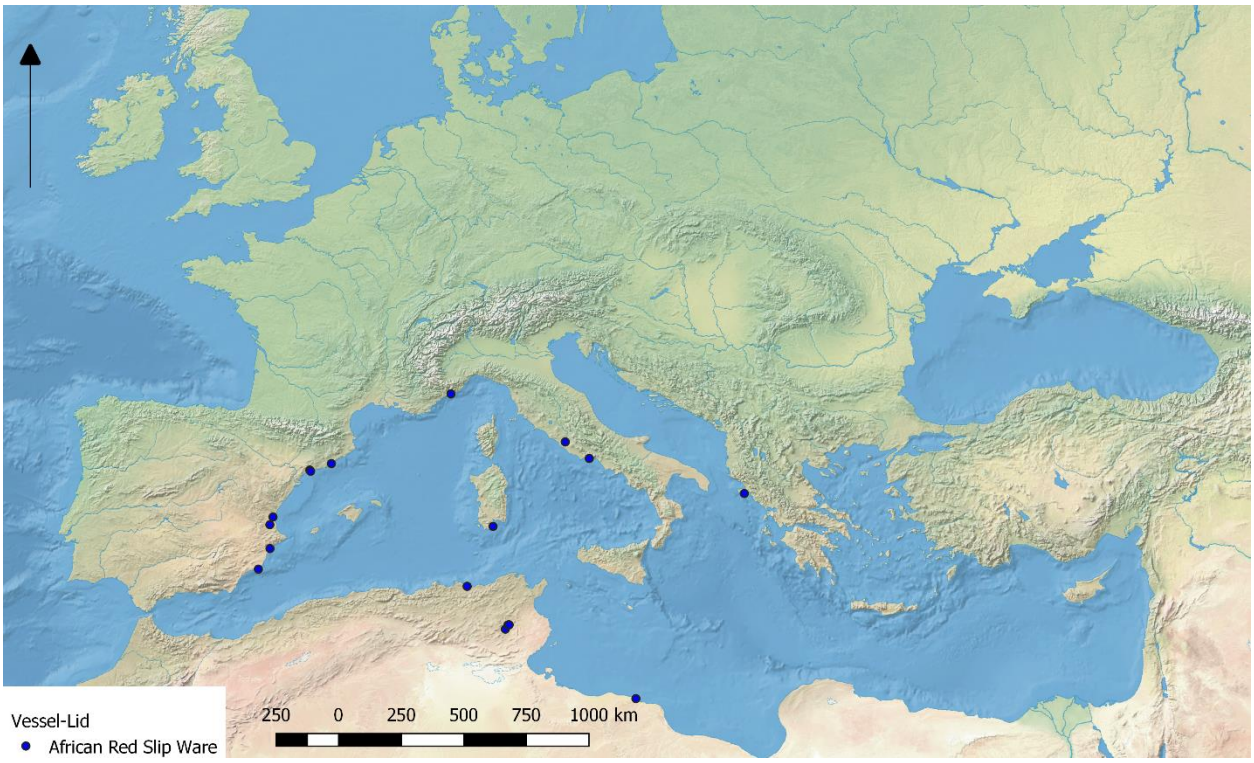


*Figure 6.6. Map showing the spread of lids per pottery type. All lids belong to ARSW.*

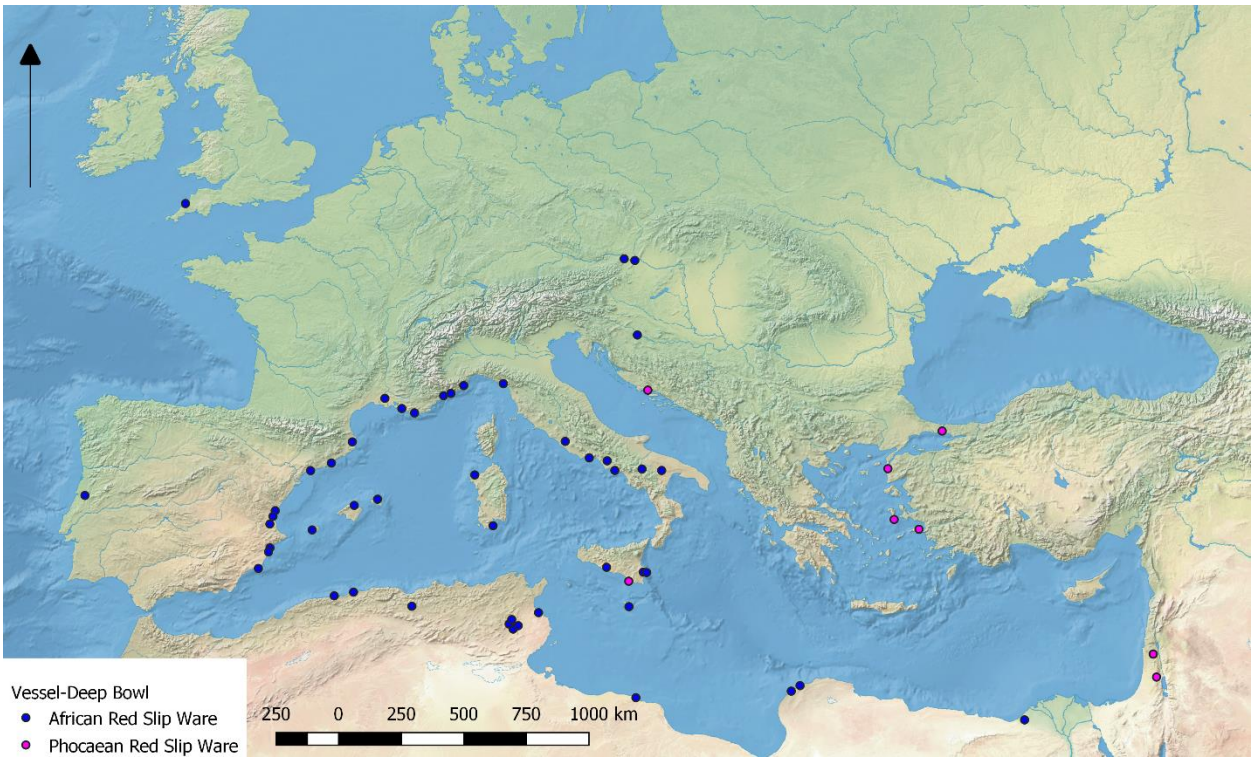


*Figure 6.7. Map showing the spread of deep bowls per pottery type. All deep bowls belong to either ARSW or PRSW.*

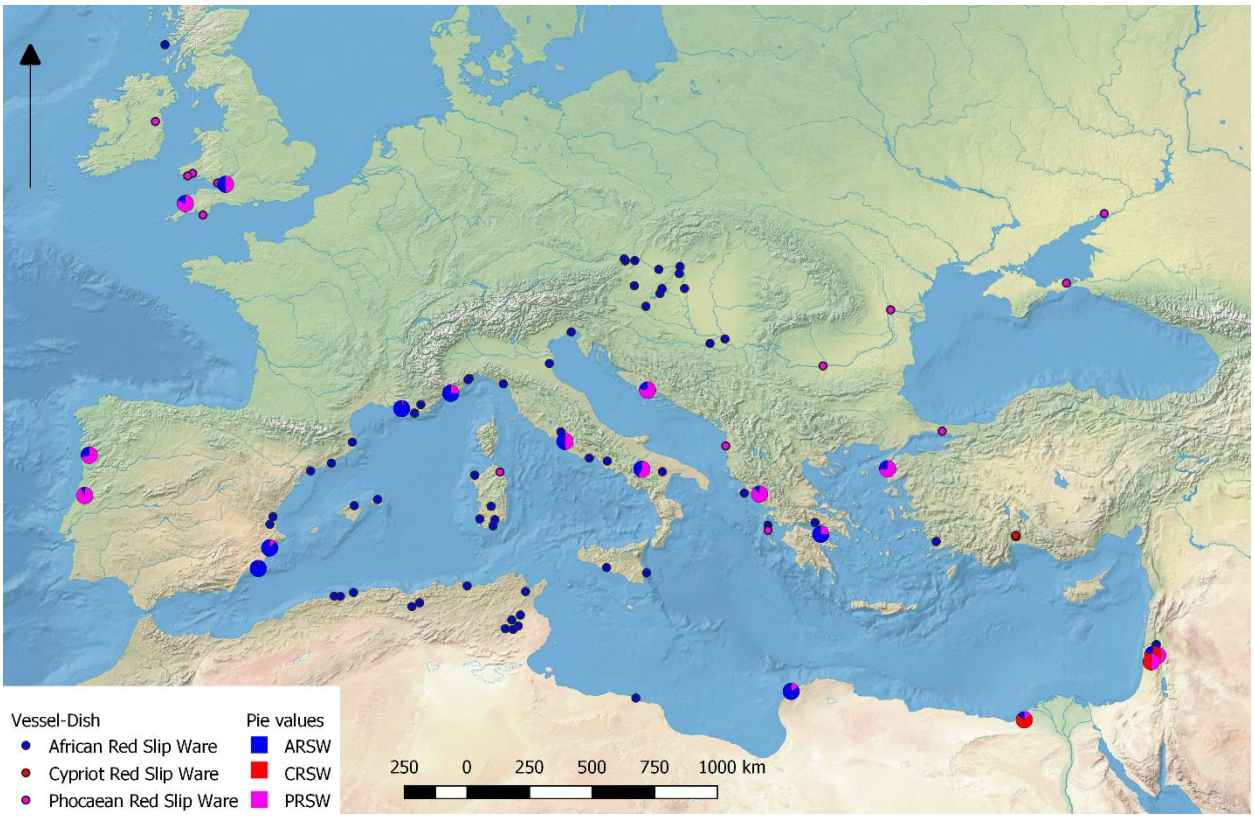


*Figure 6.8. Map showing the spread of dishes per pottery type.*

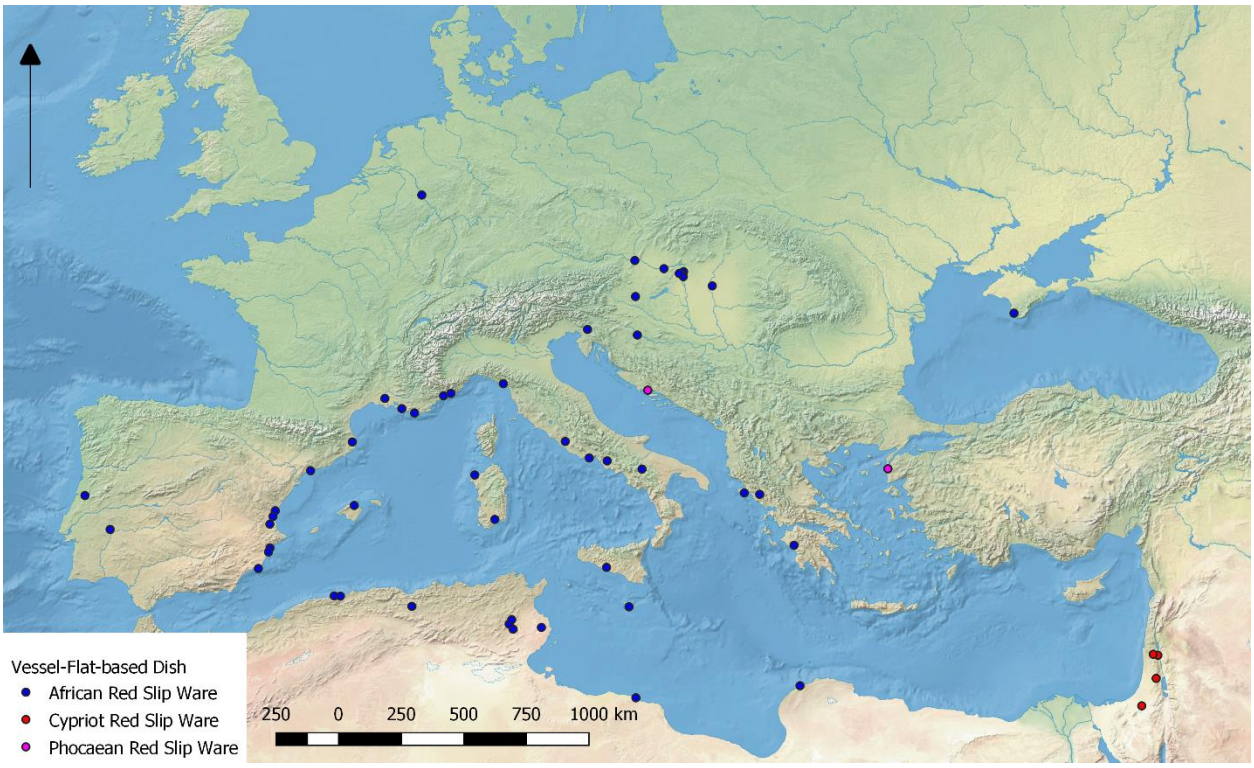


*Figure 6.9. Map showing the spread of flat-based dishes per pottery type.*

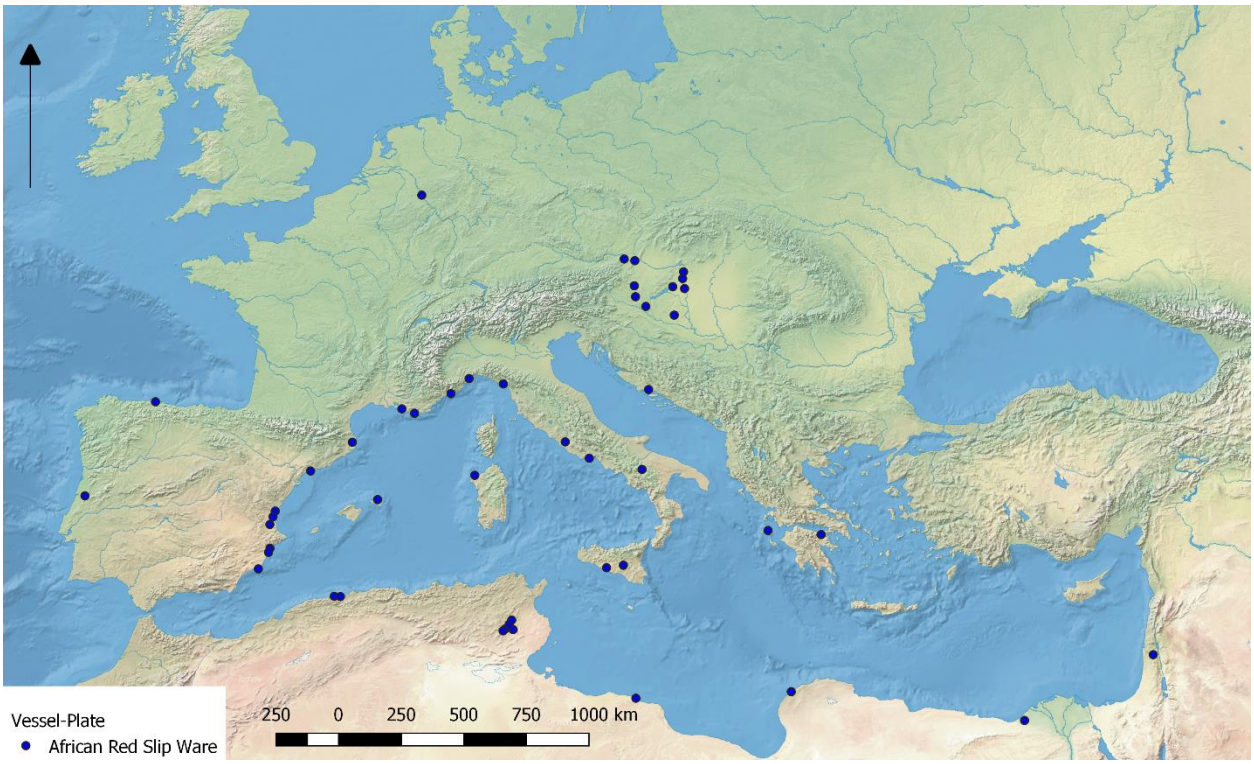


*Figure 6.10. Map showing the spread of plates per pottery type. All plates belong to ARSW.*

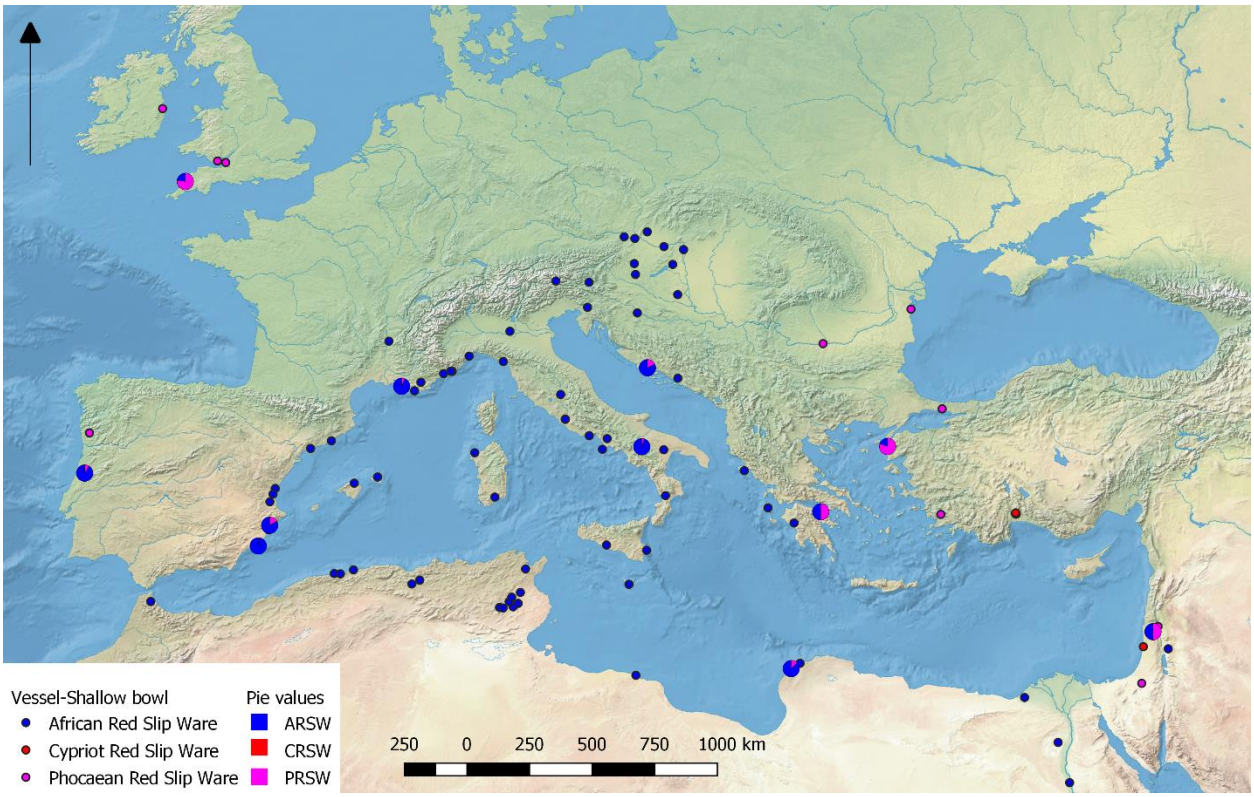


*Figure 6.11. Map showing the spread of shallow bowls per pottery type.*

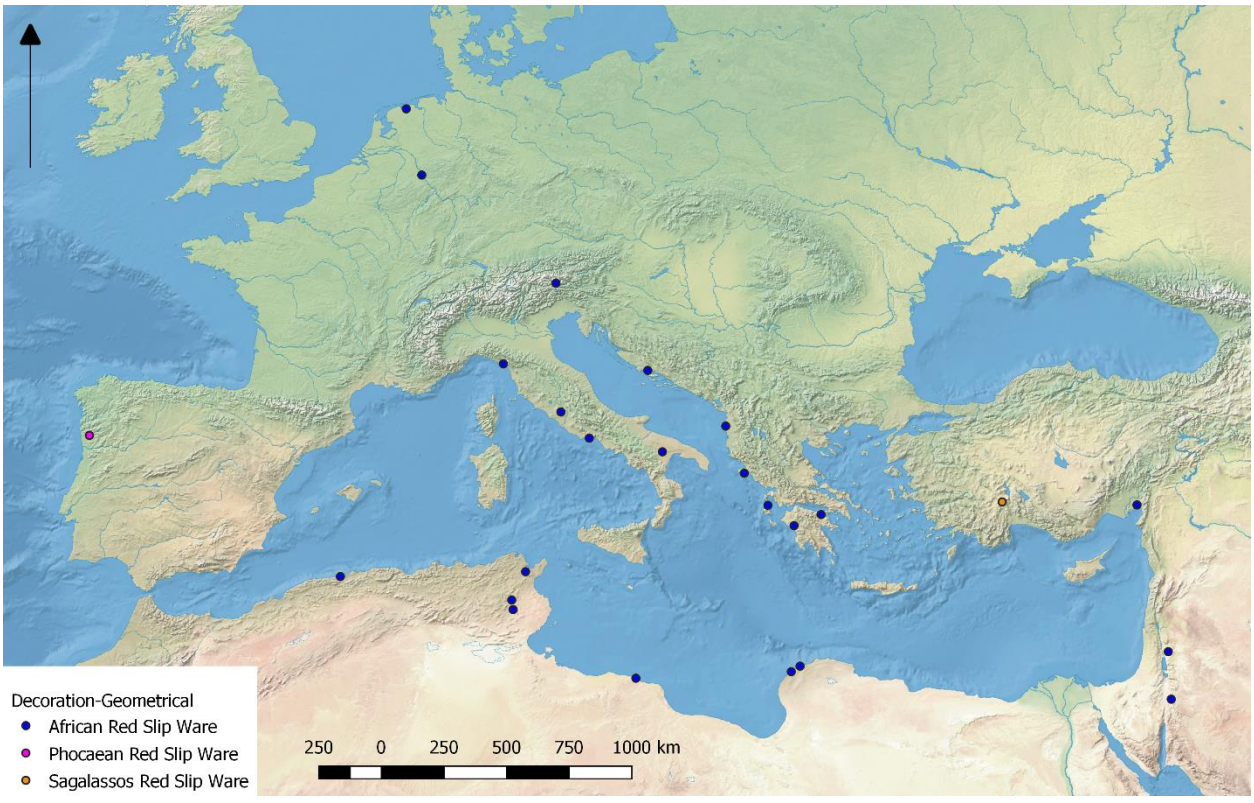


*Figure 7.2. Map representing geometrical decoration.*

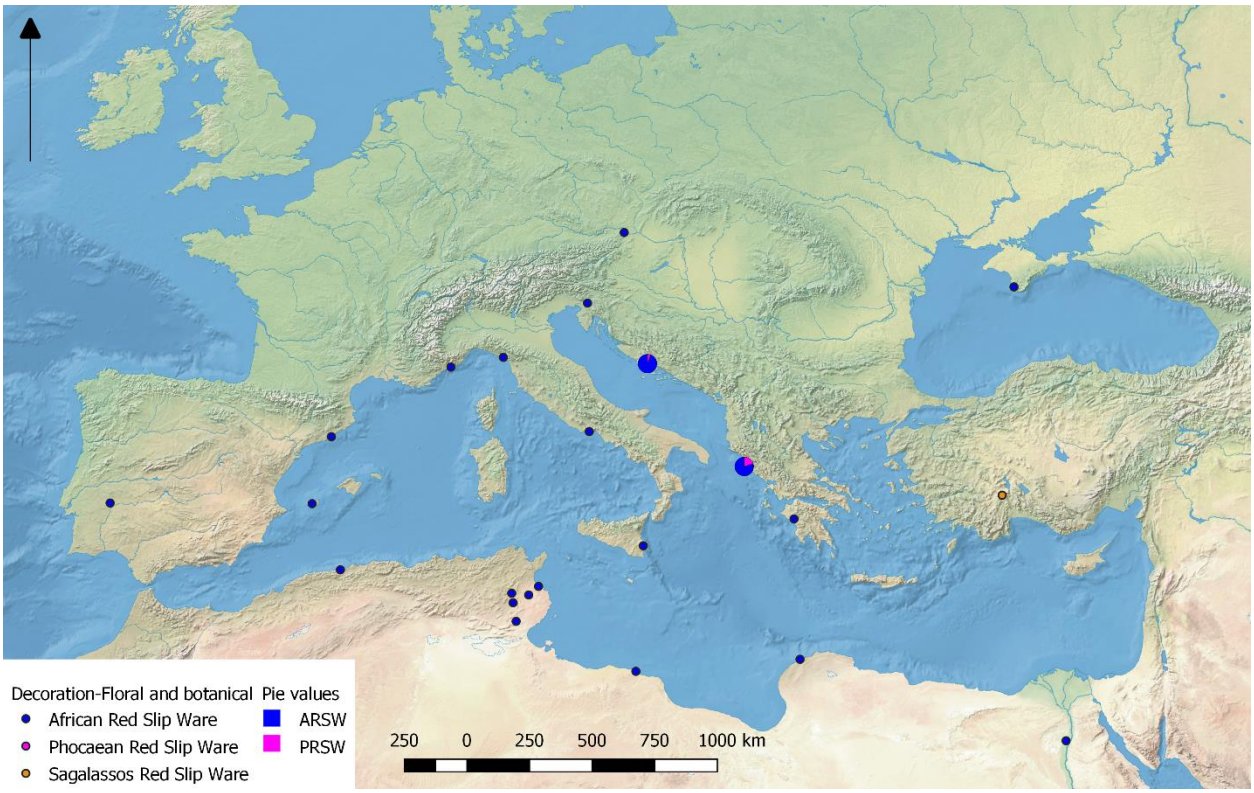


*Figure 7.3. Map representing floral and botanical decoration.*

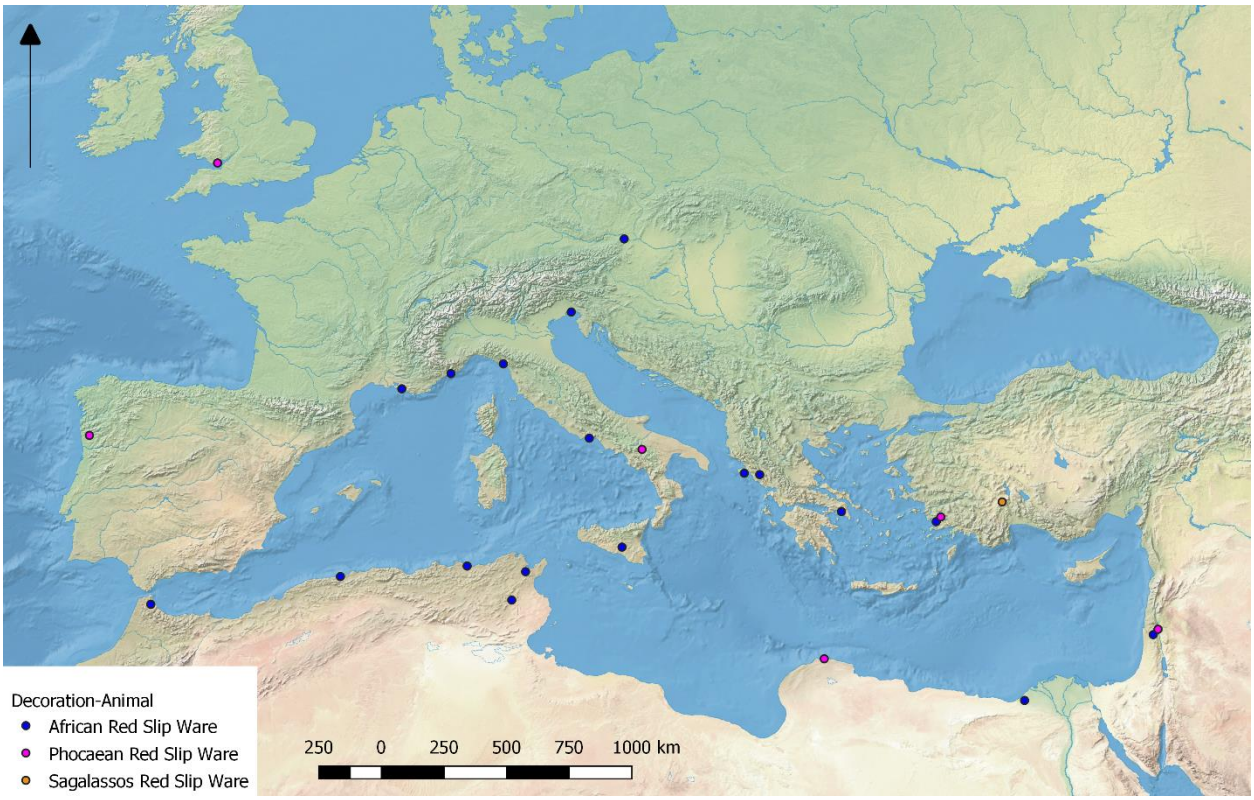


*Figure 7.4. Map representing animal and human decoration.*

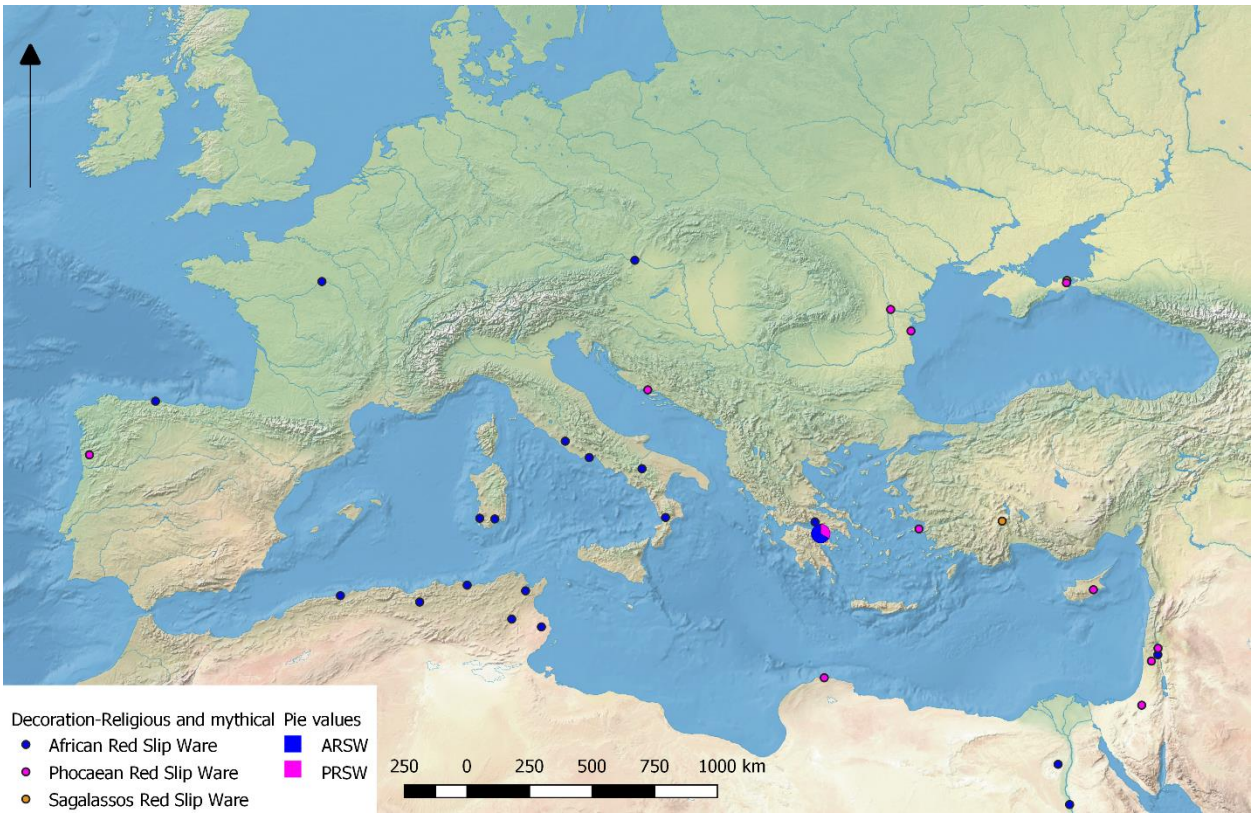


*Figure 7.5. Map representing religious and mythical decoration.*

# Appendix B: tables

## Towns

A list of all towns from the database, presented with their respective coordinates and the total number of all sherds found on the site. The author maintains a digital version of this and other tables in a database file, which is available upon request. No other tables are displayed here due to their large size, but they can be found in the database file.

| Towns | | | |
|---|---|---|---|
| **Place** | **Y-coordinate** | **X-coordinate** | **Total amount of sherds** |
| Abdera | 40 58 51.3 | 24 57 06.2 | 1 |
| Abu Mina | 30 50 29.1 | 29 39 44.8 | 11 |
| Ács-Vaspuszta | 47 43 45.7 | 17 54 13.1 | 1 |
| Adulis | 15 16 16.0 | 39 40 57.8 | 1 |
| Aetolia | 38 34 18.6 | 21 40 20.7 | 4 |
| Aguntum | 46 49 24.8 | 12 50 12.4 | 1 |
| Akçapınar Köyü | 37 07 56.5 | 30 55 15.5 | 680 |
| Alahan | 36 47 28.0 | 33 21 05.3 | 12 |
| Albenga | 44 02 57.0 | 08 12 46.1 | 3 |
| Alcúdia | 39 51 03.5 | 03 07 05.2 | 101 |
| Alexandria | 31 12 13.0 | 29 54 56.9 | 125 |
| Alexandria Troas | 39 45 06.3 | 26 09 29.8 | 5 |
| Amorium | 39 01 08.3 | 31 17 43.9 | 1 |
| Anemurium | 36 01 30.1 | 32 48 14.4 | 122 |
| Antioch | 36 12 09.5 | 36 09 40.0 | 207 |
| Apollonia (Libya) | 32 54 06.8 | 21 58 11.3 | 32 |
| Aquileia | 45 46 09.3 | 13 22 04.3 | 1 |
| Aquincum | 47 33 50.4 | 19 02 58.4 | 8 |
| Argos | 37 38 04.7 | 22 43 31.7 | 78 |
| Argyruntum | 44 18 01.4 | 15 26 10.8 | 1 |

| Towns | | | |
|---|---|---|---|
| **Place** | **Y-coordinate** | **X-coordinate** | **Total amount of sherds** |
| Arles | 43 40 38.8 | 04 37 49.7 | 4 |
| Ascoli Piceno | 42 51 13.4 | 1334 39.2 | 1 |
| Assos | 39 29 27.2 | 26 20 12.1 | 98 |
| Athens | 37 58 13.7 | 23 43 18.8 | 81 |
| Athis/Neocaesareia | 35 57 07.8 | 38 09 51.5 | 28 |
| Attica | 38 05 51.2 | 23 38 55.5 | 1 |
| Auja al-Hafir | 30 52 53.0 | 34 23 51.0 | 3 |
| Ayios Philon | 35 37 48.2 | 34 22 25.4 | 33 |
| Babarc | 46 00 20.3 | 18 22 00.5 | 5 |
| Balatonalaki-Ságpuszta | 46 52 53.5 | 17 44 56.1 | 1 |
| Bantham | 50 16 37.2 | -03 52 39.8 | 3 |
| Barcelona | 41 23 04.4 | 02 10 20.1 | 12 |
| Barumini | 39 42 10.0 | 09 00 00.0 | 1 |
| Basilicata | 40 44 10.9 | 15 40 26.8 | 99 |
| Beet She'an | 32 30 10.9 | 35 30 09.9 | 3 |
| Benalúa, Valencia | 38 20 28.5 | -00 29 53.7 | 701 |
| Berbati | 37 42 49.5 | 22 49 15.6 | 12 |
| Berenice | 23 58 06.1 | 35 29 52.0 | 163 |
| Boeotia (CN3) | 38 33 16.4 | 23 05 57.0 | 1 |
| Bordighera | 43 47 05.2 | 07 39 39.4 | 3 |
| Bracara Augusta | 41 32 54.1 | -08 25 49.5 | 87 |
| Bratislava-Dúbravka | 48 11 35.5 | 17 02 30.2 | 1 |
| Budaörs | 47 27 46.4 | 18 57 04.6 | 4 |
| Cabasse | 43 25 43.4 | 06 13 49.2 | 3 |
| Cabinteely | 53 15 36.6 | -06 09 34.7 | 1 |

| Towns | | | |
|---|---|---|---|
| Place | Y-coordinate | X-coordinate | Total amount of sherds |
| Cadbury-Congresbury | 51 22 55.5 | -02 48 14.2 | 6 |
| Caesarea Maritima | 32 30 04.1 | 34 53 32.7 | 135 |
| Cagliari | 39 13 26.3 | 09 06 48.0 | 3 |
| Calle Soledad | 37 35 59.2 | -00 59 03.5 | 216 |
| Calvatone | 45 07 37.7 | 10 26 28.5 | 1 |
| Capua | 41 06 35.6 | 14 12 37.8 | 14 |
| Carnuntum | 48 06 57.5 | 16 51 21.5 | 18 |
| Cartagena | 37 35 57.7 | -00 59 02.6 | 1 |
| Carthage | 36 51 11.0 | 10 19 23.0 | 12 |
| Caucana | 36 47 20.2 | 14 30 27.2 | 1 |
| Centcelles | 41 09 19.8 | 01 13 32.9 | 1 |
| Cherchell | 36 36 26.6 | 02 11 12.7 | 895 |
| Cífer-Pác | 48 18 38.4 | 17 30 06.8 | 1 |
| Cimiez, Nice | 43 42 47.3 | 07 16 20.8 | 5 |
| Collierstown | 53 34 22.8 | -06 34 03.8 | 1 |
| Comacchio | 44 41 45.3 | 12 10 54.4 | 9999 |
| Conimbriga | 40 05 56.6 | -08 29 36.3 | 605 |
| Constantinople | 41 01 59.9 | 28 58 38.7 | 149 |
| Constantinople, St. Polyeuktos Church | 41 00 51.0 | 28 57 11.7 | 3 |
| Corfu | 39 37 16.2 | 19 54 35.7 | 18 |
| Corinth | 37 56 28.7 | 22 55 38.6 | 93 |
| Coygan Camp | 51 45 27.6 | -04 29 13.5 | 2 |
| Cyrene | 32 49 23.9 | 21 51 28.2 | 7 |
| Dahis | 36 10 47.8 | 36 37 48.2 | 5 |
| Dertosa | 40 48 59.6 | 0 31 41.7 | 1 |

| Towns | | | |
|---|---|---|---|
| Place | Y-coordinate | X-coordinate | Total amount of sherds |
| Didyma | 37 23 06.2 | 27 15 23.2 | 21 |
| Dinas Powys | 51 26 00.5 | -03 12 55.8 | 2 |
| Dinogetia | 45 22 43.6 | 28 08 18.5 | 1 |
| Diocaesarea | 36 35 07.2 | 33 57 51.0 | 5 |
| Djémila | 36 19 16.3 | 05 44 09.7 | 3 |
| Doliche | 37 09 01.8 | 37 21 38.9 | 14 |
| Domuztepe | 37 25 51.6 | 37 04 03.9 | 15 |
| Dougga | 36 25 19.9 | 09 13 06.3 | 15 |
| Draria el-Achour | 36 43 58.8 | 02 59 39.0 | 13 |
| Dunaújváros | 46 58 31.2 | 18 56 11.4 | 8 |
| Dura Europos | 34 44 52.1 | 40 43 46.5 | 1 |
| Durrës | 41 19 37.4 | 19 27 41.9 | 9 |
| El-Djem | 35 17 46.7 | 10 42 24.8 | 2 |
| El-Haditha | 31 17 28.1 | 35 32 19.6 | 2 |
| Emporio | 38 11 15.4 | 26 01 40.5 | 459 |
| Empúries | 42 08 02.7 | 03 06 43.0 | 9 |
| 'En Boqeq | 31 11 57.6 | 35 21 46.5 | 560 |
| Ephesos | 37 56 59.0 | 27 22 01.8 | 104 |
| Epiphaneia | 36 45 13.7 | 35 08 13.2 | 85 |
| Esdrael | 32 33 27.9 | 35 19 42.5 | 12 |
| Ezinge | 53 18 41.0 | 06 26 20.9 | 25 |
| Floridia | 37 04 58.4 | 15 09 33.1 | 1 |
| Fornells | 40 03 41.0 | 04 07 50.3 | 20 |
| Gadara | 32 39 18.5 | 35 40 44.5 | 2 |
| Garranes | 39 57 25.6 | 26 14 19.9 | 3 |
| Garryduff | 51 52 09.0 | -8 24 04.6 | 1 |
| Gijón | 43 32 44.8 | -05 39 47.2 | 1 |
| Gindaros | 36 23 13.3 | 36 41 23.4 | 31 |
| Gonnesa | 39 15 58.7 | 08 28 16.9 | 1 |
| Gortyna | 35 01 37.2 | 24 58 33.9 | 443 |

| Towns | | | |
|---|---|---|---|
| Place | Y-coordinate | X-coordinate | Total amount of sherds |
| Hadjeb el-Aioun | 35 31 49.1 | 10 12 09.4 | 2 |
| Halabiyya | 35 40 28.0 | 39 49 33.0 | 4 |
| Halieis | 37 19 39.9 | 23 08 38.4 | 18 |
| Hamat Gader | 32 41 07.0 | 35 39 48.0 | 19 |
| Hemopolis Magna | 27 46 53.2 | 30 48 12.3 | 1 |
| Henchir El Gallal, Chougagiya | 35 46 31.1 | 09 52 50.3 | 6 |
| Henchir El Guellal, Djilma | 35 16 17.8 | 09 32 08.4 | 24 |
| Henchir El Guellal, Madje | 35 18 30.1 | 09 13 09.6 | 7 |
| Henchir El Guellal, Zegelass | 35 27 15.4 | 09 20 25.1 | 2 |
| Henchir El Guellel, Sidi Saad | 35 23 11.5 | 09 45 25.4 | 4 |
| Henchir Es Srira | 35 15 54.0 | 08 58 21.1 | 8 |
| Henchir Es Srira | 35 27 27.3 | 09 23 11.9 | 30 |
| Hippo Regius | 36 53 00.1 | 07 45 02.5 | 4 |
| Hippos | 32 46 44.8 | 35 39 35.3 | 63 |
| Hyettos | 38 32 32.6 | 23 05 29.1 | 34 |
| Iasos | 37 16 46.1 | 27 35 03.8 | 1 |
| Ihnasya | 29 05 23.9 | 30 56 18.9 | 1 |
| Inkerman | 44 36 14.1 | 33 36 30.8 | 1 |
| Iona | 56 19 52.1 | -06 23 38.1 | 1 |
| Iraq al-Amir | 31 55 28.2 | 35 45 41.4 | 1 |
| Ischia | 40 44 26.1 | 13 56 43.3 | 1 |

| Towns | | | |
|---|---|---|---|
| Place | Y-coordinate | X-coordinate | Total amount of sherds |
| Istria | 44 32 50.2 | 28 46 25.3 | 1 |
| Ithaki | 38 25 34.8 | 20 40 39.1 | 1 |
| Jalame | 32 43 22.5 | 35 05 25.7 | 205 |
| Jerusalem | 31 46 39.4 | 35 13 57.8 | 75 |
| Jerusalem, Dominus Flevit Church | 31 46 40.8 | 35 14 30.6 | 1 |
| Kadırgürü Mevkiisi | 37 06 43.2 | 30 56 35.0 | 2330 |
| Kallirhoe | 31 35 50.2 | 35 33 33.5 | 5 |
| Kellia | 30 46 33.5 | 30 22 05.5 | 85 |
| Kenchreia | 37 53 02.4 | 22 59 09.0 | 30 |
| Keos | 37 36 40.7 | 24 19 50.2 | 21 |
| Khirbet al-Karak | 32 42 53.5 | 35 34 20.4 | 40 |
| Khirbet ed-Deir | 31 31 37.6 | 35 15 05.1 | 1 |
| Kilree | 52 35 59.7 | -07 12 45.6 | 1 |
| Knossos | 35 17 57.5 | 25 09 35.4 | 52 |
| Köln | 50 55 30.8 | 06 57 27.0 | 5 |
| Kömbeci Mevkii | 37 09 22.3 | 30 56 17.5 | 325 |
| Kopetra | 34 44 55.9 | 33 18 43.1 | 127 |
| Koroneia | 38 21 32.9 | 22 57 35.4 | 30 |
| Kourion | 34 40 01.2 | 32 53 03.3 | 12 |
| Küçük Burnaz | 36 56 08.7 | 36 03 26.8 | 11 |
| Kythira | 36 08 54.0 | 22 59 18.5 | 31 |
| La Alcudia | 39 11 52.9 | -00 30 24.3 | 239 |
| Labraunda | 37 25 07.5 | 27 49 13.4 | 12 |
| Lechaio | 37 56 06.5 | 22 50 39.1 | 8 |
| Leptis Magna | 32 38 15.8 | 14 17 31.9 | 19 |
| Lidoriki | 38 31 42.1 | 22 12 17.5 | 2 |
| Lipari | 38 28 01.1 | 14 57 23.7 | 3 |

| Towns | | | |
|---|---|---|---|
| Place | Y-coordinate | X-coordinate | Total amount of sherds |
| Longburry Bank Cave | 51 39 58.2 | -04 43 56.2 | 1 |
| Luni | 44 03 35.6 | 10 00 22.2 | 225 |
| Magen | 31 17 50.8 | 34 25 36.4 | 10 |
| Maknassy | 34 36 13.9 | 09 36 25.2 | 4 |
| Maroni Petrera | 34 44 50.1 | 33 21 43.3 | 20 |
| Marseille | 43 17 54.3 | 05 22 02.7 | 278 |
| Matera | 40 34 52.7 | 16 35 48.9 | 1 |
| Matera | 40 36 04.3 | 16 32 32.3 | 1 |
| Matera | 40 38 17.2 | 16 30 54.9 | 1 |
| Medeon | 38 22 06.4 | 22 40 57.2 | 1 |
| Medinet Madi | 29 11 31.0 | 30 38 30.4 | 1 |
| Methana | 37 34 47.4 | 23 23 23.7 | 50 |
| Methymna | 39 22 07.3 | 26 10 23.6 | 1 |
| Nabratein | 33 00 47.6 | 35 31 01.3 | 4 |
| Nagykanizsa-Inkey kápolna | 46 28 26.0 | 16 59 10.2 | 5 |
| Nagytétény | 47 23 29.2 | 18 59 17.1 | 1 |
| Nemesvámos-Balácapuszta | 47 02 42.7 | 17 53 17.8 | 1 |
| Nepi | 42 14 25.9 | 12 20 26.6 | 8 |
| Nitzana | 30 52 30.6 | 34 27 15.6 | 17 |
| Nora | 38 59 49.1 | 09 00 59.2 | 10 |
| Oberlaa | 48 08 13.6 | 16 24 15.3 | 1 |
| Olbia | 40 55 02.6 | 09 30 07.6 | 1 |
| Olympia | 37 38 14.3 | 21 37 46.1 | 8 |
| Orléans | 47 54 02.4 | 01 54 17.9 | 1 |
| Oropos | 38 19 14.7 | 23 47 30.7 | 3 |
| Palaipaphos | 34 42 26.1 | 32 34 27.1 | 80 |

| Towns | | | |
|---|---|---|---|
| Place | Y-coordinate | X-coordinate | Total amount of sherds |
| Panayia Ematousa | 34 57 39.0 | 33 33 32.6 | 138 |
| Panticapaeum | 45 21 01.6 | 36 28 07.9 | 1 |
| Paphos | 34 45 40.6 | 32 24 29.0 | 196 |
| Páty | 47 30 57.1 | 18 49 44.2 | 2 |
| Pécs | 46 04 41.9 | 18 13 26.9 | 1 |
| Pella | 32 27 01.1 | 35 36 46.6 | 4 |
| Pelusium | 31 03 28.8 | 32 34 53.1 | 4 |
| Perge | 36 57 29.5 | 30 51 09.8 | 51 |
| Petra | 30 19 43.8 | 35 26 35.1 | 62 |
| Philadelphia (Amman) | 31 57 13.5 | 35 56 11.3 | 1 |
| Phlius | 37 50 40.7 | 22 38 47.6 | 1 |
| Pianopoli | 38 57 17.4 | 16 23 26.9 | 1 |
| Piazza Armerina | 37 23 05.5 | 14 21 50.7 | 1 |
| Pompei | 40 45 02.3 | 14 29 15.0 | 3 |
| Porphyreon (Haifa) | 32 49 28.2 | 34 57 19.8 | 30 |
| Porsuk | 37 32 12.0 | 34 34 02.7 | 2 |
| Porto Torres | 40 50 15.2 | 08 23 40.1 | 708 |
| Predjama | 45 48 54.2 | 14 07 44.5 | 2 |
| Priene | 37 39 32.2 | 27 17 57.8 | 1 |
| Pylos | 36 54 56.5 | 21 41 52.2 | 22 |
| Rabat | 35 53 07.4 | 14 24 00.3 | 6 |
| Ramat Rachel | 31 44 23.3 | 35 13 00.2 | 5 |
| Rehovot | 31 01 45.1 | 34 33 52.4 | 15 |
| Resafa | 35 37 35.3 | 38 45 33.6 | 524 |
| Rome, Domus Aurea | 41 53 33.5 | 12 29 38.0 | 11 |
| Rome, Palatine | 41 53 22.1 | 12 29 11.1 | 9 |

| Towns | | | |
|---|---|---|---|
| Place | Y-coordinate | X-coordinate | Total amount of sherds |
| Rome, San Sisto Vecchio | 41 52 49.9 | 12 29 45.6 | 39 |
| Rome, Santa Prisca | 41 52 58.7 | 12 29 01.4 | 3 |
| Rome, St. Anastasia Basilica | 41 53 15.1 | 12 29 05.6 | 101 |
| Sagalassos | 37 40 38.5 | 30 31 07.1 | 2942 |
| Sagunto | 39 40 34.2 | -00 16 45.4 | 134 |
| Salamis | 35 10 43.7 | 33 54 16.6 | 10 |
| Salona | 43 32 21.9 | 16 29 00.1 | 1 |
| Saloniki | 39 31 32.0 | 20 33 25.7 | 11 |
| Sami | 38 14 49.3 | 20 38 40.0 | 3 |
| Samos | 37 45 15.2 | 26 58 41.6 | 9 |
| San Antonio (Ibiza) | 38 58 57.9 | 01 17 43.0 | 8 |
| Sa'neh | 32 41 11.1 | 36 52 16.8 | 3 |
| Santa Pola | 38 11 42.6 | -00 33 39.8 | 122 |
| Saraceno | 37 19 42.5 | 13 38 47.1 | 29 |
| Sardis | 38 29 18.9 | 28 02 26.1 | 28 |
| Savona | 44 18 17.8 | 08 28 59.4 | 36 |
| Sbeitla | 35 14 23.8 | 09 07 12.3 | 3 |
| Sebastia | 32 16 36.8 | 35 11 26.8 | 17 |
| Sétif | 36 11 32.2 | 05 24 14.6 | 8 |
| Sidi Marzouk Tounsi | 35 36 50.9 | 09 30 31.2 | 50 |
| Silat ad-Dhahr | 32 18 59.2 | 35 11 06.9 | 2 |
| Siphnos | 36 58 27.4 | 24 44 53.3 | 8 |
| Sisak | 45 29 02.8 | 16 22 19.5 | 7 |
| Smintheion | 39 32 08.4 | 26 07 05.7 | 12 |
| Smyrna | 38 25 31.2 | 27 08 24.9 | 54 |

| Towns | | | |
|---|---|---|---|
| Place | Y-coordinate | X-coordinate | Total amount of sherds |
| Sofiana | 37 19 09.4 | 14 17 44.7 | 1 |
| Sousse | 35 49 26.8 | 10 38 14.2 | 3 |
| Southern Sinai | 28 13 10.4 | 34 05 20.4 | 8 |
| Southwest Coast Crete | 35 14 32.5 | 23 38 24.4 | 13 |
| Sparta | 37 04 55.5 | 22 25 28.7 | 15 |
| Sperlonga | 41 15 03.8 | 13 26 59.1 | 981 |
| Split | 43 30 29.2 | 16 26 25.7 | 276 |
| Sremska Mitrovica | 44 57 58.1 | 19 36 38.9 | 2 |
| Stobi | 41 33 06.9 | 21 58 31.5 | 78 |
| Sucidava | 43 45 51.5 | 24 27 32.8 | 2 |
| Surduk | 45 04 21.9 | 20 19 33.8 | 1 |
| Syracuse | 37 03 36.4 | 15 17 44.8 | 3 |
| Százhalombatta | 47 19 55.4 | 18 56 21.9 | 2 |
| Szombathely | 47 13 58.8 | 16 37 15.4 | 4 |
| Szőny | 47 44 08.4 | 18 09 23.3 | 3 |
| Tabgha | 32 52 24.6 | 35 32 57.1 | 1 |
| Tác | 47 04 52.5 | 18 24 13.2 | 2 |
| Tamuda | 35 33 33.2 | -05 24 39.4 | 1 |
| Tanagra | 38 19 37.5 | 23 32 15.1 | 155 |
| Tanais | 47 16 07.5 | 39 19 59.8 | 1 |
| Tarragona | 41 06 55.2 | 01 15 29.1 | 361 |
| Tarsus | 36 55 03.2 | 34 53 33.1 | 55 |
| Taucheira | 32 32 18.7 | 20 34 04.0 | 67 |
| Tell Ammata | 32 14 21.0 | 35 37 07.3 | 58 |
| Tell Fakhariyah | 36 50 23.8 | 40 04 07.8 | 10 |
| Tell Keisan | 32 52 22.7 | 35 09 02.8 | 81 |
| Tell Mevorakh | 32 32 00.1 | 34 55 36.3 | 1 |
| Tell Qasile | 32 06 05.8 | 34 47 42.1 | 1 |

| Towns | | | |
|---|---|---|---|
| Place | Y-coordinate | X-coordinate | Total amount of sherds |
| Tell Rifa'at | 36 28 21.3 | 37 05 41.3 | 38 |
| Thasos | 40 46 47.0 | 24 42 45.0 | 109 |
| Thespiae | 38 18 12.0 | 23 09 01.1 | 40 |
| Tinos | 37 32 21.0 | 25 09 35.3 | 1 |
| Tintagel | 50 40 08.1 | -04 45 39.4 | 31 |
| Tipaza | 36 35 41.3 | 02 26 37.7 | 49 |
| Tiszaföldvár | 46 57 54.3 | 20 14 51.8 | 1 |
| Tocra | 32 32 11.4 | 20 34 05.4 | 16 |
| Todi | 42 46 40.3 | 12 24 22.2 | 1 |
| Tolmeitha | 32 42 29.8 | 20 57 08.3 | 6 |
| Toulon | 43 07 39.2 | 05 55 35.6 | 51 |
| Troia | 39 57 25.6 | 26 14 19.9 | 30 |
| Tyritake | 45 16 40.0 | 36 24 28.0 | 1 |
| Umm El-Tlel | 35 15 03.2 | 38 53 50.5 | 2 |
| Upper Zohar | 31 14 07.3 | 35 14 32.0 | 110 |

| Towns | | | |
|---|---|---|---|
| Place | Y-coordinate | X-coordinate | Total amount of sherds |
| Uthina | 36 36 30.3 | 10 10 19.3 | 13 |
| Vado | 44 15 48.1 | 08 25 50.5 | 4 |
| Valence | 44 55 47.3 | 04 53 10.4 | 2 |
| Valencia | 39 28 28.5 | -00 22 37.6 | 515 |
| Ventimiglia | 43 47 21.6 | 07 36 31.4 | 30 |
| Vila Fernando | 38 54 57.8 | -07 19 02.8 | 1 |
| Vindobona | 48 12 28.7 | 16 21 59.9 | 15 |
| Virinum | 46 41 52.6 | 14 22 00.6 | 1 |
| Visegrád-Gizellamajor | 47 45 39.3 | 18 55 49.6 | 4 |
| Višići | 43 03 57.8 | 17 42 08.5 | 1 |
| Vrokastro | 35 07 32.6 | 25 44 28.0 | 27 |
| Xanthos | 36 21 22.1 | 29 19 09.1 | 24 |
| Zalabaksa | 46 42 07.1 | 16 32 45.7 | 1 |
| Zalalövő | 46 50 44.8 | 16 35 13.7 | 3 |
| Zeugma | 37 03 28.1 | 37 52 10.7 | 90 |