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Ancient Roman coarse ware in the *Regio X* and beyond.

An archaeological approach to distribution and trade.

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Vita and Publications

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PUBLICATIONS AND PRESENTATIONS

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Scheda 32: *Filippo De Pisis. Cento opere di collezioni fiorentine e toscane.*
Scheda 49: *L'affiche moderne française*.
in S. Massa, E. Pontelli (eds.), *«Mostre permanenti». Carlo Ludovico Ragghianti in un secolo di esposizioni*, (Lucca 2018, ISBN 88-89324-45-7).

2. C. Ardis, *La persistenza della memoria: l'Area Sacra di Largo Argentina tra propaganda e storia*, in M. Cipriani, A. Pontrandolfo, M. Scafuro (eds.), *Dialoghi sull'Archeologia della Magna Grecia e del Mediterraneo. Atti del II Convegno Internazionale di Studi*, Paestum, 28-30 Giugno 2017, 319-324 (Paestum 2018, ISBN 978-88-87744-80-4).

3. C. Ardis, R. Giovanelli, A. Traviglia, *From the fields to the web: a view on public archaeology and social media from an Italian perspective*, in M. La Russa, A. Macchia, N. Masini, F. Prestileo (eds.), *Dialogues in Cultural Heritage. Book of abstracts of the 6th International Yococu Conference*, Matera, 23-25 May 2018, 519 – 522 (Matera 2018, IBM CNR).

4. C. Ardis, A. Traviglia, *La strategia social nella comunicazione di progetti sui Beni Culturali*. Paper presented at La ricerca è Social, workshop held during the Research Communication week, Università Ca' Foscari, Venezia (I), 3 October 2018.

5. C. Ardis, R. Giovanelli, A. Traviglia, *From the fields to the web: a view on public archaeology and social media from an Italian perspective*. Paper presented at Dialogues in Cultural Heritage, 6th YoCoCu (Youth in Conservation of Cultural Heritage) International Conference, Matera (I), 23-25 May 2018.

6. C. Ardis, A. Bernardoni, R. Giovanelli, A. Traviglia, *Un-#VEiLing the potential of Social Media: Open Archaeology for public engagement*. Poster presented at Human history and digital future, 46th CAA - Computer

Applications and Quantitative Methods in Archaeology Conference, Tübingen (D), 19-23 March 2018.

7. C. Ardis, M. Capulli, S. Floreani, S. Magnani, *Trade through the Stella River: the archaeological evidence*. Paper presented at Roman Ceramic and Glass Manufactures. Production and Trade in the Adriatic region and beyond, IV International Archaeological Colloquium, Crickvenica (HR), 8-9 November 2017.

8. C. Ardis, *Life in Fragments: extracting meaning from survey ceramics. Coarse ware ploughsoil assemblages from Aquileia suburbium*. Poster presented at EMAC2017: European Meeting on Ancient Ceramics, Bordeaux (F), 6 - 9 September 2017.

9. C. Ardis, *La persistenza della Memoria: l'Area Sacra di Largo Argentina tra propaganda e storia*. Poster presented at Dialoghi sull'Archeologia della Magna Grecia e del Mediterraneo, II Edition,Paestum (I), 28 -30 June 2017.

10. C. Ardis, *Fotografia a Pompei nel XIX secolo: tra i calchi di Fiorelli e le fotografie della ditta Brogi*. Paper presented at the first conference Factuality and utilization of early photography, Roma (I), 23-24 March 2017.

ABSTRACT

Long neglected by archaeological research, coarse ware has been recognised as important source of information on ancient living practices, technological know-how and the organisation of production and trade in ancient communities only from the second half of the 20th century.

Deeply rooted within this background, this research concretely explores the possibility of using coarse ware to retrieve complex *data* for refined socio-economic analysis.

In details, focusing on the territory of the Roman colony of Aquileia, inserted in the broader framework of the *Regio X Italica* and of the whole Northern Italy, the study aims to investigating the trade of coarse ware, in order to define its nature and extent.

The research starts from the study of coarse ware collected during the 2013-2016 excavations of an unpublished underwater archaeological site, *Stella 1*, located in the river *Stella*, within the nowadays municipality of Palazzolo dello Stella (Udine District, Italy).

The investigation of these artefacts clearly points that coarse ware was traded along the river; nevertheless this trade, rather than involving the vases themselves, concerned instead their contents.

Moving from this achievement, the study broadens its sight, investigating the circulation of ancient Roman coarse ware firstly in the entire *Regio X* and then in all of Northern Italy.

A wide comparative study enabled to detect patterns of trade and consumption of ancient Roman coarse ware and its contents.

The distribution of a number of peculiar shapes, analysed in conjunction with the capillary Roman routes network, highlighted the existence of some preferential routes for coarse ware circulation, that employed both terrestrial roads and inland waterways.

The research fully exploited coarse ware informative potential, definitively confirming the value of ancient Roman coarse ware in providing powerful insights for a deeper understanding of the ancient economic and social systems.

The study of *Stella 1* coarse ware firstly enabled to achieve a better comprehension of the site itself, determining its nature as a commercial

site and clearly assessing its chronology to the second half of the 1st – 2nd century AD.

Furthermore, *Stella 1* coarse ware fully testified that these vases were traded as food containers. Despite the difficulties in determining the contents, suggestions about the nature of foodstuffs traded come from both ancient literary sources and contemporary archaeological *data*.

Coarse ware proved therefore to be a source of information about the trade of perishable materials, rarely recorded by archaeological evidences.

A wide comparative study, that took in consideration findings from the entire Northern Italy, demonstrated that, far from having only a local circulation, coarse ware was traded on a regional, and even supra-regional level, reaching also far away markets.

These results provided insights for a better comprehension of the economic system of the Aquileia's *ager*, and, more broadly, of the entire *Regio X*. The economic model that points to Aquileia as the unique centralising node, the only centre in charge of the distribution of foreign products within the *Regio*, needs to be reviewed.

Thanks to the capillarity of the Roman routes network, also other areas, only apparent peripheral, played an essential role in the circulation and distribution of products, both locally produced and imported. Goods did not necessarily need to arrive in Aquileia to be redistributed.

Some areas were responsible of the local distribution of imported products and were furthermore able to trade autonomously, even to far away markets, goods locally produced; this turned out to be particularly true for an important productive area as the *Stella* basin, served by both terrestrial routes and inland waterways.

The idea that settlements within the *ager* served uniquely the main city, Aquileia, should be therefore overcame.

As a final result, the study proved that coarse ware, when comprehensively approached, is a powerful tool for the reconstruction of complex economic dynamics, providing a better insights into the ancient system of trade and exchange.

Chapter 1

1. Introduction

Coarse ware is one of the most common finds of material culture on any archaeological site. Nonetheless this class of materials has been long neglected in archaeological studies. Until very recently, coarse ware sherds were discarded from archaeological record, since attention was mainly concentrated on finer classes of pottery.
Over the past few decades, though, coarse ware has started to occupy an increasingly important place in publications of archaeological excavations.
Scholars now widely acknowledge that also coarse ware plays an essential role in defining the chronology of sites and that it is of importance for the understanding of contexts and their functionality. Furthermore, recent research has finally demonstrated that coarse ware is an essential source of information regarding ancient living practises, technological know-how and the organisation of production and trade in ancient communities.
Against this background, and rooted in the recent study developments, this research concretely explores the possibility of using coarse ware to analyse socio-economic dynamics. The focus of the project is the analysis of ancient Roman coarse ware which was collected while conducting four archaeological excavations at *Stella 1* site. This site is a complex, underwater site, still unpublished, located within the river *Stella*, in the Western part of the Aquileia territory.

Starting with the material evidence mentioned above, and progressively broadening the sight, the study widens its target, aiming at the reconstruction of the system of pottery production, supply and exchange within the Roman colony's *ager*. Obviously, given the importance of the city as a centre also for long distance trade throughout the Roman ages, the reconstruction will go beyond the borders of Aquileia's administrative territory and will tackle the entire *Regio X*, with insights into Northern Italy as a whole.

Aquileia was chosen for this methodological approach because of its strategic position. Located close to the sea, the city was open to Mediterranean influences, but it was also well-connected to the Alpine region thanks to paths and roads which were already in use in Prehistoric times. Archaeological evidence shows that the proto-historic settlement, born in the same area in which the Romans had founded their colony in 181 BC, was involved, from 9th century BC, in commercial activities extending from Veneto to Central Italy, from the Southern Adriatic coasts to Greece.

The foundation of the Roman colony immediately turned the settlement into a central hub of the Roman road system, served by *Via Annia, Via Postumia, Via Julia Augusta, Via Gemina*, *Via Flavia,* and countless minor roads that contributed to further strengthen its leading economic role.

Despite an increasing quantity of recent research tackles the aspect of coarse ware produced and traded in the Aquileia territory, and, more broadly, in *Regio X*, several Italian scholars still tend to consider coarse ware to be a local production, excluding these materials from their economic analysis and reconstructions. Besides, current literature mainly focuses its attention on specific coarse ware forms alone, though there are partial exceptions; there is an evident lack of interest in broadening the sight in order to achieve a global comprehension of coarse ware productive patterns and trade dynamics.

Against this trend in scientific literature, the final goal of the present research will be to use the potential of coarse ware to increase the information at our disposal about the Roman economic system. This attempt will be even more meaningful if one considers that it will

involve one of the main cities of the Roman Empire, that is Aquileia and its territory.
In accordance with the goal presented above, this research proceeds to ponder and attempts to answer three questions that can be summarised as follows:
- Was coarse ware traded?
- Did the trade concern the container or the content?
- Was coarse ware traded on a micro-regional, a regional or even a supra-regional level?
By offering answers to these questions, this thesis aims at demonstrating coarse ware informative potential, well beyond its use as a mere dating tool. At the same time, it aims at demonstrating the possibility of using *data* retrieved from the study of coarse ware to achieve a better and more complete comprehension of the ancient Roman economic system.
As already mentioned, in order to answer these questions, the research examines the unpublished coarse ware artefacts collected during the 2013-2016 excavations of an underwater archaeological site, *Stella 1*.
The site is now under investigation within the framework of the *Anaxum Project - Archeologia e Storia di un Paesaggio Fluviale*, as a result of the partnership between the Department of History and Preservation of Cultural Heritage of the University of Udine and the Superintendence for Archaeology, Fine Art and Landscape of Friuli-Venezia Giulia. The project is under the technical direction of Dr. Massimo Capulli (University of Udine)[1].
The project's international research team has joined the forces with the Texas A&M University and the Institute of Nautical Archaeology, the Universities of Trieste and Padua, the University of Sidney and the University of Venice.
Stella 1 is a complex archaeological site located within the river Stella, one of the most important water courses of the lower Friuli plain, mentioned, also, by Pliny the Elder by the name *Anaxum*.

[1] I would like to thank professor M. Capulli who gave me the opportunity to study coarse ware materials from the *Stella 1* site, kindly supporting me with the facilities of the *Laboratorio di Archeologia delle Acque* at the University of Udine.

The archaeological site is composed of several units: the hull's remains of a Roman laced vessel, a submerged wooden structure and a large area of scattered artefacts, 8-10 meters wide and 80 meters in length, extending upstream, North of the hull's remains. The study of the coarse ware collected in the area during four archaeological campaigns, between 2013 and 2016, is the focus of the present work.

A variety of reasons led to the selection of the *Stella 1* site as the case study used to analyse the role played by coarse ware in the reconstruction of ancient Roman economic patterns.

The first reason lies in the very nature of ancient shipwrecks. Generally speaking, wrecks can be considered more or less closed contexts, whose chronology can be detected quite easily. Therefore they are privileged points of observation of the ancient world. Moreover, an ancient shipwreck is a snapshot of a trip that did not arrive at its final destination. While opening a window on trade during its realisation, this element offers modern archaeologists the possibility of shedding light on the ancient economy and systems of supply and exchange.

This turns out to be particularly true for the *Stella 1* site, whose location testifies to the commercial dynamicity of this area during Roman times. The *Stella*/*Anaxum* basin is characterised by an abundance of water, but also by clay beds and energy sources - in the form of timber from local forests - that allowed for the flourishing of the ceramic industry, regarding both household pottery and construction implements, in the lower Friuli plains. Thanks to both the river and other routes which were terrestrial, strictly intertwined with one another, products manufactured in this region easily found their way towards several markets located throughout, at least, the entire Northern Adriatic arch. Further proof of the complex relationship between waterways and terrestrial routes in this area of the Italian peninsula, is to be found less than one kilometre from the site. Here, three pillars of stone blocks and bricks belonging to a Roman bridge, testify to how the *Via Annia* crossed the river. The shoreline is flanked by a fourth structure; most likely, it is to be interpreted as a fluvial quay. These relics are a perfect example of the complex interactions between inland waterways and the main terrestrial roads, giving insights into the complex and integrated Roman travel and transportation network.

This research project started with the evidence provided by the *Stella 1* site and progressively the picture broadened, enabling the achievement of a global reconstruction of the coarse ware economy in the Aquileia territory and beyond. The structure of the present work mirrors the direction followed by the research.

Apart from the introduction, the thesis is organised into seven chapters. Following the introduction, chapter 2, is dedicated to the *Stella 1* site and is composed of three sections. Initially, the history of the excavations at the *Stella 1* site is retraced. The underwater archaeological deposit, currently under investigation within the framework of the *Anaxum Project*, has indeed been known to the scientific community from the nineteen eighties, when divers for sport first located the remains of the hull. The site was therefore excavated throughout the following several years, each time focusing on different aspects of its composite nature and progressively increasing our knowledge of the archaeological deposit and its surroundings. The second section describes the geographical context of the *Stella*/*Anaxum* basin, contextualising the site within the framework of the lower Friuli plain. Major archaeological findings, focusing on the Roman organisation of this Western area of Aquileia's *ager*, are briefly described here, in order to provide the reader with information about the human landscape surrounding the site. In the third section of chapter 2, attention is focused on the complex site *Stella 1*. While the remains of the hull and the wooden structure, as well as the bridge and quay remains, have been fully explored and have been published at least in preliminary reports, less than a half of the area of scattered artefacts has so far been investigated. Coarse ware analysed in this work was collected during the 2013-2016 underwater archaeological excavations within the area. While playing a fundamental role in the achievement of the main goal of this research (see above), the study of these materials also provides insights for a better comprehension of the site itself, enabling a better understanding of the relationship between the area of scattered artefacts and the hull remains.

Chapter 3 further narrows its outlook, focusing on the entire bulk of archaeological material recovered in the area of scattered artefacts found during the *Anaxum Project* excavations. Since they all belong to

the same context, looking at them in their complexity and identifying their mutual relationships is an essential step to understanding the nature of the archaeological deposit and to assessing its chronology.
Under the scientific direction of Dr. M. Capulli, several scholars are now involved in the investigation of the different archaeological materials. Professor S. Magnani (University of Udine) is working on stamped bricks; Professor A. Saccocci (University of Udine) investigated the coins; Dr. E. Braidotti gathered a preliminary identification of the amphorae, while Dr. S. Floreani (University of Udine) is responsible for glass and metal finds.
Preliminary results of this on-going research are presented in chapter 3 that, far from being exhaustive, should be approached from the point of view of supplying a brief overview, whose goal is simply to prove the overall homogeneity of the archaeological deposit. Materials are represented mainly for their chronological values, leaving any further consideration to the experts in charge of the analysis.
Since the focus of the present research is coarse ware, before facing the study of the materials at *Stella 1*, a state of the art overview was deemed necessary. An outline of current literature on the topic is, therefore, included in chapter 4. The history of the discipline, starting with the first publications made available in the nineteen seventies, is outlined initially in general terms. Then, in the second section, attention is focused on coarse ware studies in nowadays Friuli Venezia Giulia. This state of the art study underlines current achievements, while discussing open issues that still need to be completely addressed.
One of the major problems that still affects coarse ware studies in Friuli Venezia Giulia, and in general in North-Eastern Italy, is the absence of a commonly accepted methodology, collectively shared by the scientific community. The present research cannot benefit from the existence of a well-established approach. Therefore, a customised methodological approach was deemed necessary in tackling *Stella 1* coarse ware.
Chapter 5 is completely devoted to the research methodology adopted for the study of coarse ware collected within the area of scattered artefacts and more broadly for the analysis of coarse ware distribution and trade. Current literature has been taken into consideration in order to develop a methodology relying on general and widely accepted

criteria. The first section illustrates the principles that informed the creation of a typology for *Stella 1* coarse ware. Groups were created paying more attention to the similarities of vases and to their quantitative features, while minor morphological differences and qualitative attributes were mainly disregarded. The result is a morpho-typological classification, consisting in a reduced number of types and variants, that could be easily transferred to other contexts. Frequently, the customised names adopted for *Stella 1* types are flanked by denominations already proposed and widely accepted in current literature.

In the present chaotic situation, in which every team adopts a self-centred point of view and develops customized approaches to specific sets of materials, the proposed classification, that gathers together hints and suggestions retrieved from a systematic review of the literature on the topic, could be read as a first attempt to overcome this fragmentation, and head towards the acquisition of a shared vocabulary and a common approach.

Classification is not intended as a goal *per se*, but was the first step taken to move beyond the *Stella 1* site, and start to consider coarse ware production and circulation. Therefore, the second section of chapter 5 describes the principles followed in the comparative study. For a variety of reasons, analogies of *Stella 1* materials have been searched for only by looking at published reports. Unpublished contexts are unevenly accessible, and the quality of records is highly variable. As a result, considering unpublished materials could have easily led to misleading results.

Morpho-typological classification and comparative studies have provided all the information presented in the catalogue, whose basics and organisational *criteria* are entirely illustrated in the last section of chapter 5.

Chapter 6 is completely devoted to the presentation of *Stella 1* coarse ware and should be approached as an annotated catalogue.

Following the *criteria* described in the previous chapter, materials that are presented are divided into forms, types and variants. The presentation of each type follows a recurrent order: the morphological and technological description comes first; then the chronological

assessment and the geographical distribution resulting from the comparative studies are given.
Attention is, at the end, focused on the set of *Stella 1* materials, proposes a first interpretation of their presence in the analysed deposit and suggests the function they would have had in their original context.
The calculation of the carrying capacity of some containers, performed using the open source program *Archeo 4*, developed by J-F. Meffre and Y. Rigoir from the Laboratoire d'Archéologie Médiévale et Moderne en Méditerranée de l'Université d'Aix-Marseille, enabled us to identify the presence of some standardised services of *Stella 1* coarse ware, providing insights into the commercial nature of the site.
Diagnostic materials are presented through dedicated catalogue cards that regularly follow the structure presented at the end of chapter 5, with some exceptions fully explained in the text. On the cards, reference to the graphic *apparatus* is also mentioned.
Information retrieved from coarse ware materials, and presented in the catalogue, is then analysed in its broader context in chapter 7. In the first section, by recalling, also, the information provided by the other materials collected on site and presented in chapter 3, the interpretation of *Stella 1* is pursued and the first two questions that had moved the research are addressed. *Data* retrieved from both coarse ware and other *Stella 1* materials in the end determine not only the homogeneity of the archaeological deposit, but also identify it as mainly composed of goods that were traded along the river.
The dimensional, technological and morphological features of coarse ware, as well as other incidental attributes, additionally enable us to define the reasons of coarse ware trade.
Moving towards a larger frame, the second section of the chapter exploits the information provided by the geographical distribution of *Stella 1* coarse ware. The level of trade involving coarse ware, local, regional and supra-regional, is fully addressed in this paragraph, by looking at the *Stella 1* site in its geo-historical location and in its relationship with the ancient Roman routes and waterways system. The results and analysis also provide insights into the presence of possible preferential routes, proving that coarse ware can be used to retrieve

further and complex information about the Roman economic system within *Regio X* and beyond.
A complete review of the current literature flanked by the in-depth analysis of *Stella 1* coarse ware and completed by a comparative study extended to all of Northern Italy, finally demonstrate that coarse ware can be used as an indicator of complex economic *phenomena*.
Besides, the domain of research is currently mostly focused on the role of Aquileia as a *central place*, explaining all the economical transactions in the city's *ager* in terms of redistribution from the main centre to the surrounding settlements and *vice versa*. This research attempts to review this mainstream literature, highlighting the existence of a more complex system of interactions, within which also settlements and territories usually considered peripheral, like the *Stella*/*Anaxum* basin, played an essential role in creating a complex system of circulation of goods, models, people and way of life.
In this last chapter, some boundaries that have affected the present work are also mentioned. Due to a number of both internal and external limitations, it has not been possible to perform any kind of archaeometric analysis, otherwise essential for validating the hypothesis regarding the circulation of ancient materials. Only hard science can indeed confirm that findings from different sites are not simply similar, but are effectively the same products that circulated exploiting the Roman routes network.
It has, however, to be acknowledged that so far archaeometric research on materials collected within *Regio X* are far from being successful and comprehensive; and mirror the fragmentation of the studies outlined above. Archaeometric analysis has been mainly performed on individual sites, and/or sometimes even on a single form or sherd, hindering the possibility of addressing broader issues, such as a general reconstruction of regional patterns of trade and distribution.
In this respect, the present work may be considered a valid starting point for future research. The distribution maps plotted for some of the most widely spread coarse ware types may be considered a *summa* of the occurrences, and could be used for a targeted sampling that would be able to answer major archaeological questions, further reducing the costs of petrographic and chemical analysis.

Finally, major results of the study are summarised in the concluding section of the work.
Besides the main text, the thesis is completed with multiple appendices that also collect the graphic *apparatus* of the research.
Comparative studies have identified analogies between *Stella 1* materials and several other samples, collected sometimes within a wide area. Since a list of comparisons for each single piece would have been time consuming, redundant and meaningless, analogies have been summarised in easily consultable tables, gathered in *Appendix I.*
All these tables have the same structure. Besides the progressive number attributed to each site, the first column lists the city/town (where the same types are specified for different sites within the same city/town, all the occurrences are mentioned in separate rows), the second one specifies the type of site (settlement, necropolis, public building, votive deposits, *etc.*), the third one contains chronological information and the last one precise bibliographical references.
In the tables, the sites are listed according to a geographical order. Sites located within the *Regio X* borders are listed first, divided according to the ancient administrative division where possible. Sites within Aquileia's *ager* open each table, followed by those located within Trieste-*Tergeste*'s territory and followed at the end by sites belonging to the Concordia Sagittaria-*Iulia Concordia*'s *ager*. A separate section gathers together recurrent sites located in Carnia, that possibly used to belong to the Aquileia's *ager*. Other sites located within *Regio X* borders are listed at the end, in alphabetical order.
Then, sites from the surrounding Augustan *Regiones*, mainly *Regio XI - Transpadana, Regio IX - Liguria, Regio VIII - Aemilia* are listed. When it was necessary to mention other *regiones*, they were added at the end of the list. Occasionally, tables end mentioning sites located outside the border of Roman Italy.
It has to be acknowledged that administrative borders changed throughout time. Since the *Stella 1* site has broadly been dated to the 1st - 2nd century AD, it has been decided to follow the borders of the *regiones* attested during the Augustan age, when the first division of Italy into administrative units occurred.

The tables described above were the starting point of the creation of the distribution maps contained in *Appendix II.* These maps were conceived as visual tools that allow us to identify the concentration/absence of specific types and to immediately recognise the existence of preferential terrestrial or water routes taken by the recognised coarse ware types.
These maps were realised by the author, using open data software *QuantumGis* (QGis). Since, for the purposes of the present research, locations should not be plotted on modern maps, but rather inserted into the geographic context of the Roman times, the issue to create maps that reflected the reality of the time under investigation needed to be faced. For this reason, an ancient Mediterranean map was elaborated by the author, using the open-access shapefiles found on the Ancient World Mapping Centre (AWMP) website, the interdisciplinary research centre of the University of North Carolina at Chapel Hill, that promotes cartography, historical geography, and geographic information science as essential disciplines within the field of ancient studies.
The *data* provided by the AWMC was then completed, geo-referencing within the QGis workspace the maps of the Augustan *regiones* plotted in the *Barrington Atlas of the Greek and Roman World*.
The location of the sites where analogies with *Stella 1* materials were found was added using the exact geographical coordinates, when provided by the publications. In other cases, the Open Map extension supplied by QGis enabled us to locate modern localities on ancient maps.
In most cases, following research needs, two maps were plotted for each coarse ware type: the first one shows the distribution of the type within *Regio X* borders, while the second one broadens the sight to all of Northern Italy.
Appendix III contains two kinds of chronological tables. For homogeneous types, that found strict analogies with materials unearthed on other sites, *Stella 1* materials were not dated separately, the chronology being assigned to the whole type. In order to assess the dating, all the chronological information already provided in tables presented in *Appendix I* are summarised here: the result of this comparison is the chronology proposed for each type in the text.

For heterogeneous types, the table summarises the chronology of *Stella 1* materials, retrieved from the strict analogies identified by the comparative study.
This *appendix* ends with a extensive table that summarises chronologies of *Stella 1* coarse ware; it is a useful, visual tool that makes the overall homogeneity of the site evident and that clearly assesses its chronology to the second half of the 1st - 2nd century AD.
At the end of the work, *Appendix IV* gathers together the plates containing the graphic documentation of *Stella 1* materials, subdivided into pictures and drawings.
Pictures were taken by the author and then modified using *Adobe Photoshop*. Only the most meaningful pieces are included, each one with its own metrical reference.
Separate plates collect the hand-made drawings of the author. Pencil drawings were realised in full scale, and then traced, using black ink, on tracing papers. Each drawing was digitised and then implemented using *Adobe Illustrator*. Drawings are organised in typological plates, that follow the classification adopted in the catalogue. Each drawing has its own metrical reference. However, if not differently specified at the base of each plate, they have been all reduced to a 1:4 scale.

Chapter 2

Stella 1 site: historical and geographical overview

2.1 *Stella 1* site. From the discovery to the current *Anaxum Project*

North-Eastern Italy is characterised by a complex network of inland waterways that has been exploited since pre-Romans times in order to connect territories at the base of the Alps with the Adriatic Sea shorelines.
Besides rivers and lagoons, after the foundation of the Roman colony in Aquileia in 181 BC, this territory was deeply shaped by the construction of manmade canals that were built, mainly following the *centuriae* orientation, after the ancient Roman reclamation of the swamps had been executed, in order to ensure the drainage of lands

and the disposal of excess water[1].
Waterways were perceived, and have been since Roman times, as essential features of this territory; indeed Pliny the Elder, in the *Naturalis Historia*, opened the description of *Decima Regio* listing *flumina et portus:*

"Sequitur decima regio Italiae, Hadriatico mari adposita, cuius Venetia, fluvius Silis ex montibus Tarvisanis, oppidum Altinum, flumen Liquentia ex montibus Opiterginis et portus eodem nomine, colonia Concordia, flumina et portus Reatinum, Tiliaventum Maius Minusque, Anaxum, quo Varamus defluit, Alsa, Natisa cum Turro, praefluentes Aquileiam coloniam XV p. a mari sitam"[2].

The rivers described in these words are also mentioned by other ancient Greek and Roman authors, with two exceptions, the *Anaxum* and the *Varamus*, cited only by Pliny the Elder[3]; however, despite the fact that this passage of the *Naturalis Historia* has been interpreted in several ways[4], scholars now generally agree in recognising in the modern *Stella* river the *Anaxum* listed by the Roman author[5].

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[1] It is likely that the reclamation of the alluvial plain surrounding Aquileia started immediately after the foundation of the Roman colony. Excavations performed within the *Canale Anfora*, one of the main canals still connecting the city to the lagoon, proved that it is a man-made waterway built during the Republican Age (See BERTACCHI 2000, p. 31). Furthermore, *Canale Anfora* has the same orientation of the *centuriatio* system (some authors indeed proposed that Aquileia *decumanus maximum* was the canal itself. See BUORA 2000, p. 36 and mentioned bibliography), strengthening the link between the Roman organization of the colony's *ager* and the water management system.

[2] *N.H. III*, 18, 125-126.

[3] PRENC 2000, p. 71.

[4] An overview of the most important studies about this passage, containing the most likely identification of the toponyms mentioned by Pliny the Elder, is in ROSADA 1979, whose interpretations have been used in the present chapter.

[5] A little bit more complex is the identification of the *Anaxum* affluent, the *Varamus*. Countless hypothesis have been provided through the years; nowadays, the academic community agrees in recognizing the modern river *Varmo* as the *Varamus* mentioned by Pliny the Elder (for the current identification see PRENC 1992, pp. 193-194; previous hypothesis are summarised in the above-mentioned work by Rosada, cfr. ROSADA 1979, cc. 232-236).

Worthy of mention by Pliny, the *Stella*/*Anaxum* is still one of the most important watercourses of the lower Friuli plain. *Stella* river, with its three main branches (*Taglio, Stella* and *Torsa*), runs for 47 kilometres, and then flows into the Marano lagoon[6].

The river rises not far from the base of the Alps, in the spring-belt area, a territory characterised by a peculiar geo-morphological situation, that divides the higher and the lower Friuli plain. The area at the foot of the Alps presents indeed a high permeable soil that allows water, both meteoric and from rivers, to percolate the ground. In the middle of the Friuli plain, this underground water comes across a layer of impermeable soil, and it is thus forced upwards, gushing out in the so called *olle*, ponds of clear water that often, as is the case of *Stella*/*Anaxum*, generate rivers that flow through the lower plain[7].

Having been originated by an underground spring, the *Stella*/*Anaxum* has a constant water-flow rate throughout the year, and thus it could be navigated in any season[8]; this waterway has influenced human settlement from Prehistoric times, as shown by the abundant archaeological remains and structures found on the river margins and by several underwater sites identified all along its length[9].

Most recent archaeological research has now provided sufficient *data* supporting the idea that the lower portion of the *Stella* River was part of the communication system that served the Aquileia hinterland.

As suggested by Pliny the Elder's words, the *Stella*/*Anaxum*, as several other natural and artifical waterways, completed the terrestrial roads network, creating a complex, integrated system of trade and communication that links the Alps to the Adriatic sea[10].

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[6] CAPULLI 2014, p. 20.

[7] For a detailed description of the geo-morphological situation of this area, see FONTANA 2006.

[8] See GOMEZEL 1992, p. 26. "*Un elemento che contribuì a fare anche del fiume Stella una via probabilmente di notevole importanza è il fatto che si tratta di un fiume di risorgiva, dalla portata d'acqua costante, che perciò assicurava la navigabilità in ogni periodo dell'anno*".

[9] A brief overview of the archaeological sites and materials discovered along the river course, from the Neolithic site in Piancada (see below) to evidences of human presence in Medieval and Modern times is provided, with relative bibliography, in CAPULLI 2014, pp. 21-22.

[10] This system was even more efficient than the maritime routes, since, given the constant water flow of groundwater rivers, it could be used all year round (See CAPULLI 2015, p.

The discovery, in the riverbed, of the complex site *Stella 1*, that is going to be fully presented in the next pages, confirms this use of the *Stella*/*Anaxum* as an essential route for trades, in strict connection with the Roman economic system that orbited around Aquileia.

Stella 1 site[11] is located between the modern towns of Palazzolo dello Stella and Precenicco (both located in the district of Udine), about 7 kilometres North of the mouth of the river in the Marano lagoon.

Underwater research in this portion of the *Stella*/*Anaxum* started in the nineteen eighties, when divers for sport notified the presence of archaeological materials laying on the riverbed. During the summer of 1981 first investigations were performed; underwater archaeologists discovered and recorded three bricks and stones pillars, lying on a bank and surrounded by a wooden fence. They were immediately identified as the pillars of a Roman bridge, built at the stretch of the river in order to enable *Via Annia* to cross the watercourse[12].

Also the hull of a Roman laced vessel, preserved with a consistent portion of its cargo was identified on this first occasion[13].

Between 1994 and 1999 several short-term underwater surveys were carried out in the lower portion of the river, organised by the *Servizio tecnico per l'Archeologia subacquea del Ministero dei Beni Culturali*, under the direction of Luigi Fozzati and Serena Vitri; research certified the richness of the archaeological deposit, leading to the discovery of several other archaeological material both North and South of the hull[14]. The high number of archaeological traces here discovered led to the inclusion of the *Stella*/*Anaxum* river in the DAFNE project (Di

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26: "*Rispetto ai fiumi caratterizzati da un regime torrentizio, lo Stella presenta una portata d'acqua costante in tutte le stagioni, che lo ha reso una via d'acqua privilegiata in ogni epoca. Nell'evo antico, ad esempio, prima di sfociare in alto Adriatico, intersecava sia la via Annia, sia la rotta endolagunare che collegava Aquileia a Ravenna. Un articolato sistema di vie d'acqua (fiumi, canali e lagune) che offriva i vantaggio, rispetto alla coeva rotta marina, di poter essere utilizzato tutto l'anno*").

[11] A full description of the site and its evidences will be provided below in paragraph 2.3, pp. 27-33.

[12] The description of these three pillars is contained in the first report of the archaeological investigation in the *Stella* river, see BINI 1981, especially p. 29 and p. 33.

[13] A first report of the discovery was published in BINI 1981.

[14] VITRI, BRESSAN *et Alii* 2003, p. 324.

Archeologia Fluviale del Nord Est), promoted by the Superintendences of both Veneto and Friuli Venezia Giulia[15].
In 1998 a first rescue excavation was commissioned by the *Soprintendenza per i Beni Archeologici del Friuli-Venezia Giulia* to the company IDRA s.n.c., under the scientific and fieldwork direction of Serena Vitri and Francesca Bressan[16]. During this first campaign the team focused its attention on the recovery of the cargo, consisting mainly of roof tiles, found still *in situ*, inside the remainder of the hull. The second campaign in 1999[17] completed the work previously begun, recovering the remaining portion of the cargo.
The efforts were then directed to the hull remains, recorded and drawn in 1:1 scale. On this occasion also a wooden structure identified near the shipwreck was investigated and recorded.
Samples of wood, both from the hull remains and from the wooden structure, were collected to perform xylotomic analysis and radiocarbon dating, in order to identify the woods used for the structures and to assess the chronology of both elements.
During the first rescue excavation in 1998, an area of scattered artefacts had been identified nearby the cargo; the next year, further exploration revealed that this concentration of archaeological material spilled over for at least 30 metres upstream of the hull[18].
At the end of the two rescue campaigns, all the elements of the cargo were recovered and both the hull and the wooden structure were protected by several layers of geotextile, then covered with sand bags and a number of layers of sand and silt, and left *in situ*[19].
A first presentation of both the hull and its cargo was published soon after the end of the excavations; the hull was identified as a roman laced vessel and both the archaeological materials and the radiocarbon

[15] BRESSAN 1997, c. 446.
[16] It was a very short investigation, lasting only one week from 21 to 26 September 1998.
[17] This time the archaeological underwater fieldwork lasted two weeks, from 20 July to 6 August 1999.
[18] CAPULLI 2014, p. 22.
[19] Preliminary results of these two rescue excavations were immediately published in a brief report (see VITRI, BRESSAN, MAGGI 1999).

dating suggested, at that point of the research, that the site could be dated to the first half of the 1st century AD[20].

From 2011 investigations continued within the framework of the *Anaxum Project - Archeologia e Storia di un Paesaggio Fluviale*, resulting from the partnership between the Department of History and Preservation of Cultural Heritage of the University of Udine and the Superintendence for the Archaeological Heritage of Friuli Venezia Giulia. The project involves an international research team, comprehending Texas A&M University and the Institute of Nautical Archaeology; the University of Trieste and Padua, for the geophysical and geomorphological investigations; the University of Sidney and the University of Venice for the analysis of remote sensing imagery[21].

Already in 2011, during a six-week fieldwork activity, a joint team composed of members of both the Udine and Texas A&M Universities, under the scientific direction of Luigi Fozzati and the fieldwork direction of Massimo Capulli, re-opened the site, aiming at recording in details the hull remains and the wooden structure, using the newest technologies now available[22].

During the 2012 campaign, archaeologists inspected the remains of the Roman bridge over the river, only 1,500 meters North of the shipwreck; these structure was then examined again in 2015[23].

Supported by newest technologies, these recent underwater excavations not only investigated and inventoried the three already known pillars, making certain they belonged to the *Via Annia* bridge, but also identified a fourth structure. This element, made of carved stones and bricks, and located closer to the hull remains, seems to belong to a fluvial quay, that is likely to have served the nearby settlement of Palazzolo dello Stella[24].

Being able to perform one excavation campaign each year from 2013 on, the *Anaxum Project* team is investigating a large segment of the river

[20] A first, brief but comprehensive, report of the results of the two rescue excavations in 1998-1999 is in VITRI, BRESSAN *et Alii* 2003, with detailed information on both the hull and the cargo.

[21] CAPULLI, FLOREANI 2016, p. 48.

[22] CAPULLI, CASTRO, FOZZATI 2012, p. 17.

[23] CAPULLI 2015, p. 28.

[24] CAPULLI 2014, p. 23.

flow, determining the borders of the area of scattered artefacts, that has now been recognised as a stream of archaeological materials 8-10 meters wide and 80 meters long, situated upstream, North of the hull remains[25]. Research is still on-going in this area: so far, in 208 square meters, almost 9 thousand kilos (8.921,5 kg) of archaeological materials have been collected.

The *Anaxum Project*, adopting a multidisciplinary approach and facing multiple questions, added to the investigation of the *Stella 1* site a large portion of the river and its shorelines; indeed the aim of the project is to reconstruct the relationship between human settlement and the fluvial landscape and to assess to what extent changes occurred through time[26].

Looking at the broader context will make it possible to solve the complexity of the site and to understand its nature; all this information would then be essential to reconstruct the history of this peculiar area, so heavily influenced by the river not only from a geographical point of view, but for its overall development.

2.2 Geographical context

The *Stella* river runs for approximately 47 kilometres from the foot of the Alps to the Marano lagoon, crossing a variety of territories with different morphological features; the Northern part of its flow is indeed characterised by dry-meadows, while its Southern part, bordering the lagoon, is dominated by a maritime landscape, where water-meadows, mash-type vegetation and aquatic plants prevail[27].

Even if the archaeological research in this area has never been systematic, thus hindering the possibility to reconstruct the history of human settlement in the lower Friuli plain in its entire complexity, *data* so far collected confirm that territories on both sides of the river have been long-inhabited. The oldest traces of human presence date indeed

[25] CAPULLI, CASTRO 2016, p. 31.
[26] CAPULLI 2014, p. 22.
[27] *Bacino dello Stella*, p. 3.

to the Neolithic period: in 1992 during the excavation of a large Neolithic productive settlement along the *Stella*/*Anaxum* river, the most ancient human remain unearthed in Friuli Venezia Giulia, the *bambina di Piancada*, was recovered. Only the skull and a small portion of the limbs were preserved; analysis proved that they belong to a young girl, dated 5000 - 4000 BC[28].

It is during Roman times, however, that both the river and its surrounding natural sources started to be fully exploited by humans. After the foundation of the Roman colony of Aquileia in 181 BC, followed by an extensive operation of landscape engineering, inland waterways became essential for the development of the entire Northern Adriatic area. Rivers, canals and lagoons, navigable all the year round, had been already used by local populations for trade and communication; Romans flanked the natural waterways with an extensive network of manmade canals, the so called *fossae*, that had its central node in Aquileia.

This network mainly ensured the connection between the city and her inland territories, but it also linked the Roman colony to Ravenna, creating a waterways connection among the lagoons of Grado, Marano, Caorle, Venice and Comacchio, making upwind sailing unnecessary and thus guarantying communication throughout the year[29].

Waterways, both natural and artificial, became complementary to the system of terrestrial roads, creating an useful and efficient transportation system that enabled the development of its central node, Aquileia, as a cosmopolitan city, whose trades connected not only territories North and South of the Alps, but also the Eastern and Western part of the Roman Empire[30].

Waterways and terrestrial routes were not isolated units. They crossed each other in several places, linking the land with the lagoons and the sea. A sound proof of this connection is provided by the complex site *Stella 1* itself. The archaeological deposit is indeed located exactly at one

[28] See the above-mentioned CAPULLI 2014, p. 21 and cited bibliography. A detailed list of pre-Roman archaeological traces along the Stella river banks (with previous bibliography) can be found in *Bacino dello Stella*, pp. 5-6.

[29] *Bacino dello Stella*, p. 8.

[30] CAPULLI 2013, p. 19.

stretch of the river, were the *Stella*/*Anaxum* was crossed, through a bridge[31], by the *Via Annia*, one of the most important consular Roman roads. It was built already in 131 BC by the praetor *Titus Annius Rufus*, in order to connect *Atria* (the modern Adria) with Aquileia, passing through Padova-*Patavium*, Quarto d'Altino-*Altinum* and Concordia Sagittaria-*Iulia Concordia*.

The *Via Annia*, crossing the entire *Cisalpine Gaul,* fostered the development of the territories located West of the Roman colony of Aquileia; the *Stella* basin, at that point well inserted in this network of both waterways and terrestrial routes, started to fully exploit its natural sources, becoming one of the most important productive districts of the Aquileia's territory.

After the foundation of the Roman colony, and especially after the distribution of lands to veteran soldiers performed by Julius Caesar and again by Augustus, human presence in this territory experienced an extraordinary growth[32]. Nevertheless, the territory maintained its traditional nature, remaining mainly a rural area, characterised by a dispersed settlement pattern, with a low number of small, compact, nuclear towns, surrounded by scattered farms and *villae rusticae*[33].

The abundance of water, the presence of extensive good quality clay deposits, as well as the great availability of timbers, enabled the flourishing, within this territory, of several pottery workshops and brick kilns. As well as other productive facilities, they were usually located inside or nearby the *villae rusticae* that soon became active productive centres for a variety of goods, producing both autonomous self-sustainment and a surplus to be traded[34].

Already in the nineteen eighties archaeological research lead by the University of Trieste and the French School in Rome[35] identified, within

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[31] For a detailed description of the bridge remains discovered North of the site, with further bibliographical references, see above, chapter 2.1, p. 16.

[32] PRENC 1996, p. 243.

[33] *Bacino dello Stella*, p. 15.

[34] CAPULLI 2013, p. 21.

[35] Preliminary reports of the excavation were published immediately after the fieldwork research: see CARRE, ZACCARIA 1987, CARRE ZACCARIA 1989 and CARRE, ZACCARIA 1991. The latest publication of this contest is in MAGGI 1998, pp. 82-112, that also widely quotes previous references.

the premises of a large Roman *villa rustica*, a pottery workshop with at least two kilns within the municipality of Teor (UD), at Casali Pedrina[36].

Recent surveys and the publication of a number of archaeological materials collected throughout the years either by private citizens or during previous research, suggested that this pottery workshop used to produce mostly brick and tiles, coroplastic decorations[37], weight looms and *dolia*.

The workshop activity seems to have started in the second half of the 1st century BC, reaching its production peak during the 1st century AD. Pottery making stopped at the beginning of the 2nd century AD, but the site was not abandoned. The same area has been interested by human presence between the 4th and the 6th century AD; during this second phase of frequentation, following a practice common in late antiquity-early Middle ages, productive facilities seem to have been re-used for residential purposes[38].

Recent topographic research demonstrated that the Casali Pedrina *villa rustica* and its workshop were connected to the *Via Annia*, and thus to the *Stella*/*Anaxum* river, by means of a secondary road that take its origin from the *Via Annia*, starting in Muzzana del Turgano (UD). The road, heading to Codroipo (UD), passed through Rivignano, a central settlement during Roman times, and crossed the *Stella* river at a ford located in Chiarmacis. This secondary route made a faster connection with Codroipo possible, wading the river without a detour and avoiding the bridge crossing the more frequented consular road[39]. This connection with both waterways and terrestrial routes enabled the *villa rustica* in Casali Pedrina to trade in a faster and cheaper way its

[36] VENTURA, CIVIDINI, MAGGI, MAGRINI 2006, pp. 82-83.

[37] One of the most important coroplastic objects discovered in the Casali Pedrina workshop is a terracotta *antefix* with a *gorgoneion*, dated to the second half of the 1st century AD. It follows models from Central and Southern Italy coroplastic art, but its apparent hasty realization seems to suggest its nature as local product. (The antefix has been published firstly in STRAZZULLA 1987, pp. 212-213, n. 275 and then, with other materials from the same archaeological context, at that time still unpublished, in the catalogue *Bacino dello Stella*, p. 37, n. 77).

[38] VENTURA, CIVIDINI, MAGGI, MAGRINI 2006, p. 83.

[39] MAGGI, MASELLI SCOTTI *et Alii* 2009, p. 82.

products, coming from either the rural or the pottery workshop activities.
The *Via Annia* was not the only consular road passing through Western Aquileia territories; another one was the *Via Postumia*, built in 148 BC by the consul *Spurius Postumius Albinus Magnus*. This road connected Genoa to Aquileia, passing through the southern part of the *Gallia Cisalpina*, with a route that passed through the flatlands crossed by the river Po .
Within the *Stella* basin two secondary roads departed from the *Via Postumia*, the first one in Flumignano (UD) and the second one in Flambro (UD). Before reaching their common final destination, the modern town of Rivignano, they joined in a rural area commonly known as *Il Bosco*, located within the municipality of Flambruzzo (UD).
At the confluence of these two secondary roads, near the *Stella/Anaxum* river, recent surveys and non-invasive methods identified a *villa rustica*, again with its own pottery workshop. The surrounding landscape is characterised by several clay deposits; aerial photography revealed countless artificial pits resulting from ancient activities of clay mining[40].
Data retrieved from this research encouraged some limited archaeological excavations that recently brought to light structures pertaining to the residential part of the *villa rustica*, completed by a nearby pottery workshop with at least three kilns[41].
Materials unearthed testify a production centred mainly on bricks and tiles; so far at least twelve different stamps have been recognised and identified, suggesting that the site served several producers[42].
No waste materials concerning vessels production have been found; nevertheless the excavators believe that the workshop located in Flambruzzo - *Il Bosco* manufactured also coarse ware vases, mainly *ollae*

[40] The archaeological deposit has been investigated using the most advanced geophysical methods available, such as magnetometer and Ground Penetrating Radar (GPR); for a detailed description of both the methods applied and the results reached, see PRIZZON, CIVIDINI *et Alii* 2003.
[41] MAGGI 2001, p. 69.
[42] CIVIDINI, DONAT *et Alii* 2006, p. 29.

belonging to two different types, *Auerberg ollae* and another regional kind of handmade pot, characterised by a linear combed decoration[43].
Coarse ware manufacturing is suggested by several hints, such as some technological features of this kind of pots, that can be spotted only on materials collected from this site or the immediate surroundings. The production of *Auerberg ollae* in sets, from small beakers to bigger containers, confirms a local production. Furthermore, archaeometrical analysis performed on some samples unearthed on site yielded common markers in the chemical and petrographic composition of raw materials collected from the nearby clay pits[44].
The workshop was active between the first half of the 1st century BC and the end of the 1st century AD[45]; it is likely that after this first phase the site remained in use for residential purposes till the end of the late-imperial age[46].
Less information are available for a third pottery workshop, devoted to the production of bricks and tiles, probably located within a *villa rustica* in Stroppagallo, near Pocenia (UD)[47]. This *villa* was built in a residential area, well connected to the major Roman routes network through a secondary road departing from *via Annia* in Muzzana del Turgnano (UD)[48].
Finally, surveys identified in *Braidis*, near Sivigliano (municipality of Rivignano), at less than 50 metres from the *Stella*/*Anaxum* riverbed, one of the biggest *villae rustica* so far identified in Aquileia's territory, with a structure considered a pottery kiln[49]. The site is located at a crossroad, where the river *Stella* meets the secondary road that directly connected the *Via Annia* and the *Via Postumia*.
Archaeological remains identified already in the nineteen seventies belong to a spacious residential centre with a large productive annex, whose presences have been confirmed by more recent research

[43] For further information, see chapter 6.1.7 *Ollae 7*/*Olle Cassani*/*Pavia di Udine I-III*, pp. 254-259 and 6.1.9 *Ollae 9*/ *Auerberg ollae*, pp. 289-300.
[44] CIVIDINI, MAGGI, MAGRINI 2006, p. 72.
[45] PRIZZON, CIVIDINI *et Alii* 2003, p. 32.
[46] MAGGI 2001, p. 70.
[47] VITRI, BRESSAN *et Alii* 2003, p. 330.
[48] *Bacino dello Stella*, p. 11.
[49] MAGGI 1992b, p. 202, n. 12.

conducted at the beginning of the 21st century[50]. As the other *villae rusticae*, the site reached its *floruit* during the 1st century AD and remained in use for residential purposes till the 5th century AD; then, in 8th century AD it became a burial place[51].

All these four pottery workshops shared some common features:

- they produced mainly bricks and tiles, that reached both sides of the North-Adriatic arch according to the spread of producers' stamps;
- they were well connected to both terrestrial roads and inland waterways running West of Aquileia;
- they operated mainly between the second half of the 1st century BC and the second half of the 1st century AD.

According to current interpretations, the wide spread of building materials manufactured within the *Stella* basin suggests that bricks and tiles here produced exploited all the routes available in order to reach Aquileia, the major harbour of the region, from where they could have been sent to any other part of the growing Roman territories[52].

All these workshops reached their productivity peak in a period of expansion of the Roman influence in the North-Eastern Adriatic, when Romans founded several new colonies in *Histria* and *Dalmatia*; the local production of fired clay building materials within the *Stella* basin (and, more generally, in the lower Friuli plain), was intended to answer also the growing needs of these recently founded settlements on the North-Eastern shores of the Adriatic sea. As soon as the new settlements started their own manufacturing units, around the middle of the 1st century AD, the workshops along the *Stella* river declined[53] .

These evidences confirm the *Stella* basin as one of the most productive areas within Aquileia's territory; besides *villae rusticae* also small villages and little towns allowed this productive district to fulfil the needs of a successful and dynamic economy.

Within the *Stella/Anaxum* basin, *villae rusticae* are so far the most attested evidences; however it has to be noticed that, in an area still

[50] The entire context has been recently published in MAGGI 2001, pp. 115-175 (see this contribute for previous bibliography).
[51] MAGGI 2001, p. 118.
[52] CAPULLI 2013, p. 22.
[53] PRENC 1996, p. 243.

widely exploited for rural purposes, the wide and complex structures belonging to *villae rusticae* are easier to be identified. Traces of these large facilities are more likely to have been preserved by modern agricultural works compared to more ephemeral remains of light-built settlements.

Scattered farms, large *villae rusticae* and small villages were flanked by at least some central settlements, situated at important crossroads, hosting state buildings as well as headquarters for local officers, that served for major administrative, political and economic purposes. Up to now, only few can be guessed and/or have been detected; indeed, in nowadays urban area, bigger settlements could have been completely destroyed by the growing of modern towns, located right on top of the ancient ruins.

The biggest central settlement within the *Stella/Anaxum* basin should have developed in the place now occupied by the modern town of Palazzolo dello Stella (UD)[54], located at a river stretch and at the crossing of the *Via Annia* with the river. The modern name of the town, connected to the Latin word *Palatium*, carries the suggestion of the important role of the city [55].

Two more major settlements have been identified in Muzzana del Turgano and in Rivignano, located on departure points of secondary routes, one from the *Via Annia* and the other from the *Via Postumia*.

A minor settlement emerged in *Il Bosco*, within the modern municipality of Flambruzzo, at the above-mentioned confluence of two secondary roads[56].

The situation so far outlined demonstrates that, beyond the abundance of natural resources, the surroundings of the *Stella* river played an essential role in the economic development of the Aquileia's territory in Roman times. The *Stella/Anaxum*, far from being only a secondary river, was a vital element in the intense commercial traffics throughout the Roman era (and beyond).

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[54] The identification of Palazzolo dello Stella as one of the central settlement of the Western Aquileia territory has been confirmed on the base of the archaeological evidence. See PRENC 2013, p. 24 and mentioned bibliography.

[55] PRENC 1992, p. 195.

[56] *Bacino dello Stella*, p. 15.

The complex site *Stella 1*, with its numerous and various evidences, that are going to be described in details in the next paragraph, froze in time one moment of the countless trades that used to happen along the river flow; thus it turns out to be a privileged point to shed light on the economic dynamics of Aquileia hinterland.
The Roman colony, joining the Alps and the Adriatic Sea through inland waterways and terrestrial routes and linking the Eastern and the Western side of the Roman Empire, became one of the main centre of the Roman Empire for the circulation of men, goods and ideas[57].

2.3 *Stella 1*: a complex site

The underwater archaeological site *Stella 1* furnishes evidences with not yet fully determined interactions.
The correct interpretation of the entire archaeological deposit, besides the various features it contains, is complicated by the intrinsic characteristics of the site, located only 5/6 meters beneath the water surface.
The archaeological deposit has always been easily accessible to divers for sport, who have indeed visited the site for many decades, stealing a discrete amount of archaeological material, as testified by the especially low quantity of diagnostic fragments when compared with the non-diagnostic ones[58] .
Furthermore, the year round regular river flow causes a continuous mingling of the archaeological deposit, mixing ancient artefacts with modern material thrown in the water, and spreading all over finds originally located nearby[59]. The displacement of materials is therefore deeply influenced by post-depositional dynamics caused by the river flow; these movements are currently being studied since, far from being purely fortuitous, they seem to follow a pattern, whose

[57] CAPULLI 2013, p. 22.
[58] CAPULLI, CASTRO, FOZZATI 2012, p. 18.
[59] Indeed it happens quite frequently to find joining fragments collected in different and distant area. For a detailed analysis of the artefacts dislocation, see chapter 7.1, pp. 371-386.

comprehension could improve the overall understating of the entire site and the characteristics of the displacement of archaeological materials[60].

Being continuously exposed to both natural and artificial agents, the site lays itself open to different possible and equally trustable interpretations; this is the reason why research is still on-going, acknowledging that only the exploration of the entire area, and the study of all the materials collected, can provide reliable answers.

Stella 1 site consists of several archaeological features, located within a relatively small portion of the river.

The clearest and most investigated element of the site is the ship hull, discovered with part of the cargo still *in situ*. The cargo was completely recovered during the nineteen nineties, while the hull remains were left in the river bed.

The preserved portion of the hull lies on the left margin of the river, almost perfectly oriented East-West, at an angle of around 45° to the axis of the river; the barge is a little more than 2 meters wide, but its length is still unknown, since only a portion of the entire ship is preserved[61].

It was a flat-bottomed boat, suitable for sailing on rivers, like the ones mentioned by Livy, speaking about the war Romans engaged against the *Venetorum gentes* in 2nd century BC[62]. The barge was made with laced planks, following a traditional construction system invented by Greek shipbuilders already in the 6th century BC, but usually replaced in Roman times by the most common building technique of the time, which used mortise, tenon and nails. However it is now widely demonstrated that the sewn-plank technique remained in use along both the Eastern and Western coast of the Upper Adriatic Sea, perhaps because this boat-building technique was simpler and cheaper, and better adapted to the needs of building boats and ships of simple shapes and limited dimensions[63]. Within these regions laced vessels

[60] CAPULLI 2014, p. 24.

[61] CAPULLI, CASTRO 2016, p. 32.

[62] See LIV., X.2, 7: *"fluviatiles naves ad superanda vada stagnorum apte planis alveis fabricatae"*.

[63] BELTRAME, GADDI 2013, p. 303.

were built for a period of over a millennium, from pre-Roman to Medieval times[64].

Wood samples collected from the hull during the 1999 rescue campaign underwent analysis that produced sound results. The ship planks were made of oak (*Quercus sp.)*, elm (*Ulmus sp.*) and spruce (*Picea abies*). All these trees are native to the region, and, especially oak and elm, were the most commonly used by Roman shipbuilders, since their technological characteristics made them particularly suitable for the use in the water[65].

Boats of this type, simpler than contemporary seagoing ships, were used to commute up and down rivers and between lagoons, usually carrying heavy loads, playing an essential role in regional economy. Ships made the circulation of people, animals and goods possible in a faster and cheaper way in comparison to the terrestrial routes[66]. This particular situation is testified to by the composition of the *Stella 1* cargo, found in the position it must have had on the ship when it wrecked on the river. Removed during the two rescue campaigns in 1998-1999, the cargo was mainly composed of roof tiles, some of them still preserving the makers' stamps, stacked in vertical piles on the ceiling planks to a height of about 60 centimetres[67].

Underwater excavations during the nineteen nineties[68] brought to light also several amphorae fragments, belonging to shapes commonly used to store and trade wine, a *Terra Sigillata* plate *Conspectus 3* with the potter's stamp *in planta pedis*[69], and a small, single-handled pitcher in fine ware[70]. Among the finds there were also some glass fragments, some metal tools and a number of nails[71].

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[64] For a complete accounts of laced vessels so far discovered in a wide territory spanning from Northern Italy to Croatia, see Table 1 in CAPULLI, CASTRO 2016, p. 30.

[65] VITRI, BRESSAN *et Alii* 2003, p. 336.

[66] CAPULLI, CASTRO 2016, p. 30.

[67] VITRI, BRESSAN, MAGGI 1999, c. 436.

[68] For a more detailed description of the *Stella 1* artefacts, see chapter 3, pp. 34-68.

[69] GOMEZEL 1992, p. 26. The stamp bears the name *ALBANI,* recognisable in OCK 61.7 and associated to a pottery workshop active in the Po valley between the end of the 1st century BC and 45 AD. For a more detailed description, see below, chapter 3.2, p. 43.

[70] For a detailed description of this find, see below, chapter 3.8, pp. 59-60.

[71] VITRI, BRESSAN, MAGGI 1999, c. 436.

The bricks' stamps and the mark on the *Terra Sigillata* plate immediately suggested that the cargo could be dated to the 1st century AD[72], as also confirmed by radiocarbon dating performed on the samples taken in the nineteen nineties[73].
In 2014 more wood samples, collected within the *Anaxum Project*, and analysed in the framework of the *Sutiles Project*, narrowed the date to the second half of the 1st century AD[74].
Information provided by bricks and tiles testifies that the cargo was mainly composed of local products, suggesting that the loading place could have been the nowadays nearby town of Palazzolo dello Stella, where archaeological remains seem to indicate the existence of a settlement that concentrated political, administrative and economic functions. It is still to be determined whether it was a *vicus*, a *mansio*, a *mutatio* or other kind of land-occupation[75]. A further evidence in this direction is provided by the correct interpretation of one of the structure lying on the river bed as a fluvial quay, that should have served this settlement.
It seems that the boat was moving downstream on the river, but its final destination still remains an open issue: it could be either Aquileia, reached through the series of inner-lagoonary channels and waterways, or the harbour at the mouth of Stella river, mentioned by Pliny the Elder, but whose location has not been yet identified[76]. In both cases, once the boat reached its final destination, materials of the cargo should have been transferred to larger vessels and then shipped to both the

[72] CAPULLI, FLOREANI 2016, p. 48.
[73] VITRI, BRESSAN, MAGGI 1999, c. 436.
[74] CAPULLI, CASTRO 2016, p. 38.
[75] MAGGI 1992, p. 23. For a detailed description of the geo-historical context, see above, chapter 2.2, pp. 19-27.
[76] The existence of a harbour at the mouth of the *Stella-Anaxum* river was originally proposed by Rosada already in 1979, following a particular interpretation of Pliny's words (see ROSADA 1979). This explanation of Pliny's passage is still to be considered the most likely one, forcing the conjecture and holding for true the presence of a harbour at the mouth of the river despite the lack of archaeological remains either recognised and/or discovered yet. For a detailed interpretation of Pliny's words in this direction see PRENC 2000, pp. 73-75.

Eastern and Western Adriatic coasts, where in 1st century AD a number of new Roman colonies were founded[77].
It is also likely that the boat, whose peculiar shape made it suitable also for endo-lagoonary navigation, could have directly joined maritime trade connecting upper Adriatic harbours.
Taking the ancient Roman transportation system into consideration, the relationship between inland waterways and terrestrial roads and the connection between the harbours of the Upper Adriatic Sea shoreline testified to also by ancient sources, all the three hypothesis seem to be quite reasonable.
The *Stella 1* site comprehend also the remains of a wooden structure, found near the hull. It is composed of two layers of planks, approximately seven metres long, slightly curved at their Northern extremities[78].
This was firstly considered to be an element belonging to the boat, likely a portion of the structure that should have covered the hull; this first hypothesis was soon discarded when radiocarbon dating suggested a chronology earlier than the one derived from the results provided by the samples analysed from the woods that built the ship[79].
Furthermore, the wooden structure is composed of two layers of planks, fastened together with mortise and tenon joints, a construction technique completely different from the one used for the hull.
The wooden structure probably belonged to a containment barrier that used to secure the riverbank, later dragged to the centre of the river after erosion and consumption[80].
The third element of the complex site, identified North of the shipwreck during the river exploration in the nineteen eighties, is a wide area of scattered artefacts. Excavations are still ongoing, while its full extension has been ascertained within the framework of the *Anaxum Project*.
Starting with the first underwater explorations, archaeologists tried to understand the relationship between this dispersion area and the hull

[77] VITRI, BRESSAN *et Alii* 2003, p. 331.
[78] CAPULLI, CASTRO 2016, p. 37.
[79] VITRI, BRESSAN *et Alii* 2003, p. 335.
[80] CAPULLI, CASTRO, FOZZATI 2012, p. 18.

remains; indeed the composition of archaeological materials in these two sub-contexts is almost identical[81]. However this stream of archaeological materials occupies an area eight to ten metres wide and eighty metres in length[82]. Only less than a half has been already investigated; nevertheless almost nine thousand kilos of materials have been collected, suggesting, at a preliminary glance, that not all of them could be part of the cargo[83].

Since the high number of artefacts seems incompatible with the holding capacity of the hull[84], the dispersion area is currently under investigation, in order to collect information about the site nature and its formation process.

Indeed, only the exploration of the entire area, completed by the entire recovery, mapping and inventory of all the artefacts, could firstly enable the distinction between materials belonging to the cargo and those not pertaining to the ship. In a second step of the research, this distinction will make it easier to identify the size of the boat and its cargo carrying capacity[85].

Regarding the artefacts not pertaining to the *Stella 1* ship, exploration of the entire area could ascertain whether they belonged to more than one ships wrecked in the same area during the 1st century AD, or if this stream of scattered artefacts is the result of a longer and more complex formation process[86].

Coarse ware materials analysed in this work were collected during 2013-2016 underwater archaeological excavations within this area of scattered artefacts. Their studies aims also at providing further *data* for a correct interpretation of this area of scattered artefacts and its

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[81] A first, telling proof of the homogeneity of the two contexts was collected already during the first under water explorations in the nineteen eighties, when scuba divers brought to light some from the area of scattered artefacts brick bearing the stamps *C. Titi Hemerotis* and *Valeriae Magnae Epidiani* already identified among the building materials of the cargo. See BINI 1981, p. 33.

[82] CAPULLI, CASTRO 20016, p. 37.

[83] CAPULLI, FLOREANI 2016, p. 48.

[84] It has to be noticed that only a portion of the hull has been preserved and that research is still ongoing in order to determine the real dimension of the whole boat. For a further discussion about this topic, see below, chapter 7.1, pp. 371-386.

[85] CAPULLI, CASTRO 2016, p. 39.

[86] CAPULLI, FLOREANI 2016, p. 48.

relationship with the other *Stella 1* archaeological evidences, in order to reach a complete and trustable interpretation of the site in its complexity.

Chapter 3

The archaeological deposit

Research on the complex site *Stella 1* is still ongoing; indeed, while the hull has been completely excavated and recorded, the area of scattered artefacts still needs further investigations.
This area, extended upstream the shipwreck remains for about 80 meters, is composed by an high number of archaeological materials, well visible even from the surface; at a first impression this massive concentration of artefacts does not seem compatible with the relatively small dimension of the hull.
For this reason, within the framework of the *Anaxum Project*, this area has been divided in squares using a 2 for 2 meters grid and the complete inventory, recoding and collection of materials has been planned.
Currently ongoing excavations and research aim to define the boat size and its carrying capacity and to determine whether this concentration of materials has been created by the dispersion of one or several ships' cargos, or if it is the result of a different formation process[1].

[1] CAPULLI, FLOREANI 2016, p. 48.

Almost nine thousand kilos (8.921,5 kg) of archaeological materials have been so far collected in 208 square meters, that is less than an half of the whole dispersion area; all the most important archaeological materials classes are represented in the whole assemblage (see the pie-chart in *figure 1*).

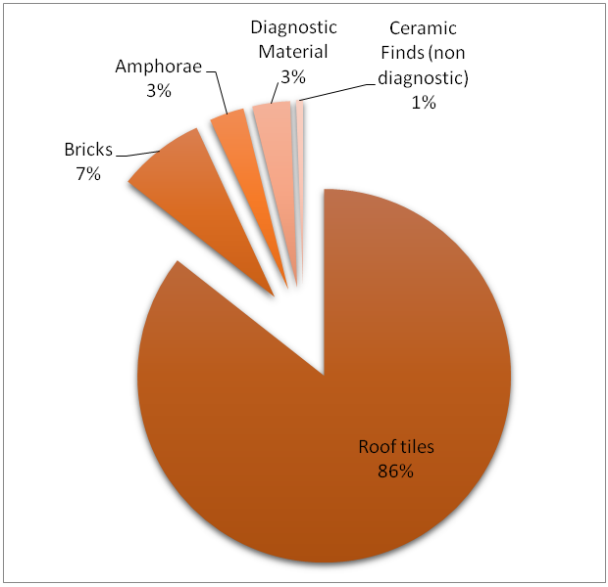

Fig. 1. Pie-chart showing the percentage of each class of materials collected within the area of scattered artefacts during the 2013-2016 excavations (author's elaboration)

Materials excavated in this area show a composition quite similar to the ones recovered on the barge during the excavations performed in the nineteen nineties: the majority of the deposit is composed by roof tiles and bricks, while other kinds of artefacts are represented only by a small percentage[2].

The chronology of the site is still pending; while radiocarbon dating of the hull and the archaeological materials of the cargo date the ship remains to the 1st century AD, within the area of scattered artefacts some later materials, up to the 4th century AD, flanked by a very small

[2] CAPULLI, CASTRO 2016, p. 37.

percentage of more recent artefacts, have been recovered; they appear homogenously spread all over the archaeological deposit[3].

The majority of materials suggests a chronology compatible to the artefacts recovered during the previous investigations; furthermore it has to be acknowledged that the presence of later materials could be due to the process of the deposit formation and/or to the peculiar context of the river, whose perennial flow causes a continuous mingling of the objects in the river bed, mixing ancient materials and modern artefacts thrown in the river.

Given this situation and the consequential chronological problems, the present chapter provides a brief overview of all the materials collected during the 2013-2016 excavations[4].

Indeed, the nature of this archaeological deposit and the definition of the general chronology of the site could be reached only taking into consideration the total of the collected finds.

Since they all possibly belong to the same context, only a complex analysis that compares all the findings, taking into consideration also their mutual relationship, could lead to serious conclusions, e.g. of chronological nature.

The following pages should be considered only a preliminary overview, useful to provide a general idea of the materials collected on *Stella 1* site; since the main aim of this review is to prove the homogeneity of the archaeological deposit and to assess its overall chronology, archaeological materials are going to be presented following an order that mirrors their informative potential, and especially their chronological value, disregarding the percentage of attestation of each class.

[3] CAPULLI, FLOREANI 2016, p. 49. For a further discussion on this topic, see below, chapter 7.1, pp. 371-386.

[4] Under the direction of professor M. Capulli, each class of materials is currently under investigation of different members of the team, i.e. Professor S. Magnani, Professor A. Saccocci and Dr. S. Floreani. I would like to thank Professor M. Capulli, for the possibility he gave me to get in touch with other scholars involved in the project and for the opportunity he provided us to share preliminary *data*.

3.1 Building materials[5]

In the underwater concentration of artefacts, bricks and roof tiles, both *tegulae* and curved *imbrices*, represent the 93% of the finds by weight (see *figure 1*); roof tiles and bricks represent the majority of artefacts within materials both collected directly above the cargo and in the area of scattered artefacts.
This similarity becomes even more specific looking at the distribution of objects within the class of building materials: they mainly consist in roof tiles (92%), and the majority of them are *tegulae* (see pie-charts in *figure 2a-b*).

Figg. 2a-b. Pie-charts showing the percentage of roof tiles and bricks (2a) and of tegulae, imbrices *and bricks* (2b) *collected during the 2013-2016 excavations (author's elaboration)*

Roof tiles were the most attested materials also within the cargo; reports of the nineteen nineties excavations registered that they were located in the centre of the hull, in at least three parallel lines, following a *modus operandi* already known also in other shipwrecks (see *figure 3*)[6].
Fifty-four stamped bricks recovered from the first surveys in the nineteen eighties in the whole *Stella 1* site turned out to be of particular importance for the purposes of the present research.

[5] I would like to thank Professor S. Magnani for the information he provided me about his currently on-going study on stamped tiles recovered on *Stella 1* site.
[6] VITRI, BRESSAN *et Alii* 2003, p. 329.

First investigations in the nineteen eighties already recovered several building materials, both intact and fragmentary; five of them preserved a stamp, attesting the activity of four producers: *M. Albius Rufus, L. Epidius Theodorus, C. Titius Hermeros* and *Valeria Magna Epidiana*[7].
Excavations of the hull remains during the nineteen nineties brought to light over 120 roof tiles, belonging without any doubt to the cargo; seventeen of them bear the stamps of six different producers. Besides the already mentioned *M. Albius Rufus, L. Epidius Theodorus, C. Titius Hermeros* and *Valeria Magna Epidiana*, the seventeen stamps collected on the hull attested also the products of *M. Albius Macrus* and *C. Oppius Agathopus*[8].

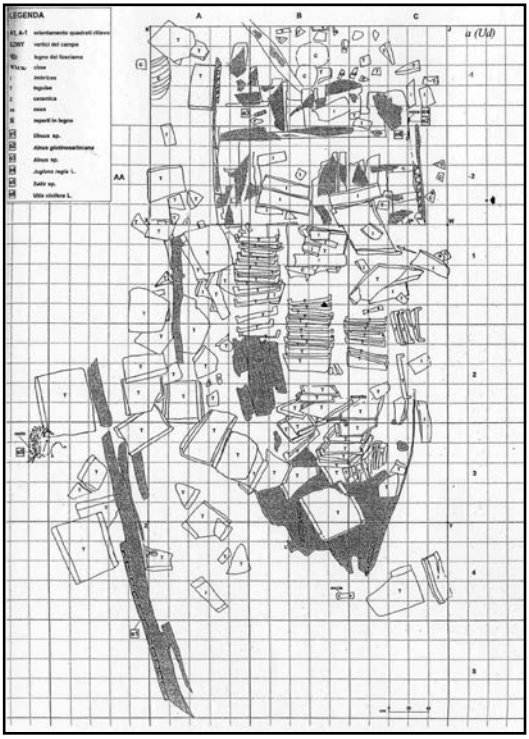

Fig. 3. Drawing of the Stella 1 *hull with its cargo*
(From VITRI, BRESSAN *et Alii* 2003, fig. 2, p. 327)

[7] See BINI 1981, p. 31 and p. 33 and GOMEZEL 1992, p. 26.
[8] VITRI, BRESSAN *et Alii* 2003, p. 331.

These same names are also attested on the stamped tiles collected during the most recent research in the area of scattered artefacts. Here, excavations performed within the *Anaxum Project* brought to light thirty-two stamped tiles. Besides the producers already attested by previous discoveries, the marks *Abudius*, *Epidiorum C.M.* and *Statius Iustus Iustus* have to be added [9].

The 54 stamped tiles recovered since the first identification of the site overall testify to nine local producers (see *table 1*), whose workshops, mostly active in the first half of the 1st century AD, seem to have been located on the banks of the river *Stella*/*Anaxum* and in the immediate surroundings.

Stamp	**Provenance**			**Total**
	in the hull	in the hull?	in the dispersion	
Abudius?			1	1
M. Albius Macer	2	1	4	7
M. Albius Rufus		2	7	9
L. Epidius Theodorus	9	1	2	12
Epidiorum C. M.			4	4
Statius Iustus			2	2
C. Oppius Agathopus	1			1
C. Titius	1			1
C. Titius Hermeros	2		6	8
Valeria Magna Epidiana	3		6	9

Table 1. Table summarising the producers' name attested on Stella 1 *roof tiles collected from 1981 to 2016*
(Professor S. Magnani's elaboration)

The two stamps *M. Albius Macrus* and *M. Albius Rufus* refer to the activity of two members of the same family, the *gens Albia*, well attested in Aquileia; they are both known as bricks and tiles producers[10]. Their

[9] CAPULLI, CASTRO 2016, p. 31.
[10] *Made in Rome and Aquileia*, A2.14, p. 192.

workshop has been located in the *villa rustica* of Stroppagallo (Pocenia, UD), in the Western territory of Aquileia, not far from the *Stella* river[11].
Producers who marked their tiles with *L. Epidius Theodorus*, *Valeria Magna Epidiana* and *Epidiorum C.M.* belong to the same family, the *gens Epidia*, well known in the Aquileia's territory as owner of brick and tiles workshops[12]. The *Epidii* productions is attested by four different stamps: L. *Epidi Theodori, Valeriae Magnae Epidian, C. Petroni Apri> Epidian* and *Epidiorum C.M.*
The presence of three out of four stamp variations among the *Stella 1* finds supports the hypothesis that their workshops could have been situated somewhere along the *Stella* river[13]. Indeed, the above-mentioned *villa rustica* of Stroppagallo seems to have been the production place also for bricks stamped *Valeriae Magnae Epidiana*[14]. It is still to be defined whether this *villa* hosted a shared workshop or a kiln used by different tile manufacturers, as a result of subsequent contracts.
Building materials with the stamp *C. Titius Hermerotis* may have been produced along the *Stella/Anaxum* river; it is possible that they were made within the pottery workshop located inside the *villa rustica* of Casali Pedrina, in the municipality of Teor (UD)[15].
However, the toponym *Titianus,* today attested in an area near Precenicco, suggests to situate here the *fundus Titianus*. In this area, near to one of a *Stella/Anaxum* docks, archaeological materials collected from the ploughsoil suggested the presence of a *villa rustica* with a pottery workshop, possibly a *figlina* belonging to the *gens Titia*[16].
The stamp *Statius Iustus* is testified by two samples; it is less common, yet it is attested in Aquileia's territory as well as in *Histria*, *Dalmatia* and *Picenum*. Epigraphic features seem to suggest a chronology within

[11] VITRI, BRESSAN *et Alii* 2003, p. 331. For a detailed presentation of the *villa rustica* see also chapter 2.2, p. 24 and mentioned bibliography.
[12] The presence of a huge *figlina* owned by the *Epidii* family in the *Regio X* was recognised already at the end of the 19th century by C. Gregorutti in his monumental work about pottery producers' stamps in Aquileia's territory. See GREGORUTTI 1888.
[13] GOMEZEL 1995, cc. 29-31 and c. 53.
[14] GOMEZEL 1992, p. 27.
[15] CIPRIANO, MAZZOCHIN 2007, p. 658. For further information about the *villa rustica*, see chapter 2.2, p. 22.
[16] For the connection with the toponym *Titianus* and the *gens Titia*, see PRENC 2000, in particular pp. 78-83.

the first half of the 1st century AD[17]. Recently, it has been proposed to locate the workshop of this producer along the *Stella* river, in the municipality of Muzzana del Turgnano, where several bricks and tiles bearing this stamp have been found[18].

One tile of difficult reading (*Abudius?*) seems related to the *gens Abudia*, whose activities are mainly testified in the South-Western portion of the Aquileia's territory by three different stamp variants. A great concentration of stamped bricks and tiles was found on the ploughsoil in the *villa rustica* of Casali Pedrina (Teor, UD), where a pottery workshops was active in the 1st century AD. Epigraphic documents testify a relationship between the *Abudii* and other pottery producers in Aquileia territory; nearby realised surveys make it likely that the *Abudii* could have shared the productive facilities located nearby the *Stella 1* site, also exploited by other producers[19].

Stella 1 stamps bear witness of workshops located along the river banks, in close proximity to the shipwreck and the area of scattered artefacts.

The only exception is *C. Oppius Agathopus*, commonly associated with a production located in the territory of nowadays Concordia Sagittaria, about 20 kilometres from the site[20]. However, this area was well connected to the *Stella* basin through the *Via Annia*, thus allowing for very fast exchanges between the two domains[21].

To sum up, *Stella 1* bricks and tiles suggest that these building materials were produced from the first half of the 1st century AD in several local workshops. However the same marks were spread throughout sites along the upper Adriatic Sea. They can be found not only in the *Regio X*, but also in Slovene, *Histria*, *Dalmatia*, and even in nowadays Italian region of Veneto, Emilia Romagna, Marche and Abruzzo[22].

The diffusion shows a pattern of mass-production in huge workshops, exported beyond the regional borders. In the 1st century AD the *Stella* basin must have been one of the richest production districts of

[17] *Scavi ad Aquileia* 1994, p. 92.
[18] CASASOLA 2013, p. 92.
[19] BUIATTI 1994, pp. 426-427.
[20] VITRI, BRESSAN, MAGGI 1999, c. 439.
[21] VITRI, BRESSAN *et Alii* 2003, p. 331.
[22] Information provided by Professor S. Magnani.

architectural ceramics in the whole Aquileia's *ager*[23]. The distribution area of these stamps follows the commercial itineraries that used to connect Aquileia with both the internal regions and the Northern Adriatic seashores, exploiting in the first case inland waterways and in the second one coastal navigation routes[24].

The presence of nine different stamps and their distribution within the *Stella 1* site provide insight about the cargo composition and the process of formation of the archaeological deposit.

Stamped tiles are quite homogenously distributed within the area of scattered artefacts (see *figure 4*) and tiles with the same names were found all over the area (see *figure 5*).

This peculiar situation could be seen as a proof of the homogeneity of the archaeological deposit, whose chronology, based only on stamped building materials, could be generally assessed to the 1st century AD.

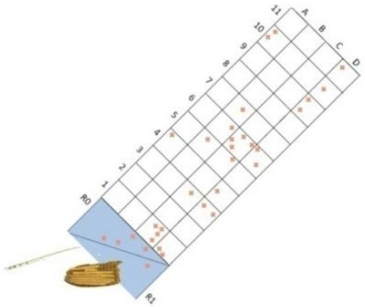

Fig. 4. Distribution of stamped tiles in the area of scattered artefacts (author's elaboration)

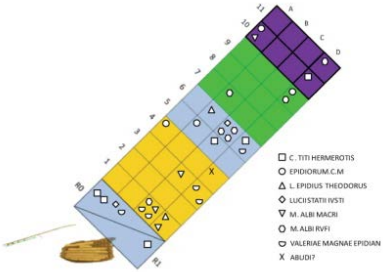

Fig. 5. Distribution of stamped tiles, with the indication of producers' names in the area of scattered artefacts (Professor S. Magnani's elaboration)

If for the tiles found in the area of scattered artefacts there is the possibility that they originally did not belong all to a single cargo, six out of the nine names were already known from building elements collected during the nineteen eighties - nineteen nineties excavations directly on the hull. This is a clear evidence that bricks and tiles made

[23] VITRI, BRESSAN *et Alii* 2003, p. 331.

[24] STRAZZULLA RUSCONI 1984, p. 154.

by different producers and in different sites were traded at the same time on the same ship.
This gives a clue as to ancient transport practices: the cargo of fluvial barges like the one discovered in the *Stella/Anaxum* was not necessarily composed simultaneously in one place. Since the cargo consisted of goods manufactured in different places and by different producers, changes along the way are likely. During the trip towards its final destination the barge presumably stopped at different docks, quays and little harbours loading new products in exchange with the ones already on board.
This kind of dynamics, so far testified with major evidence only by building materials, must be taken into consideration in the overall comprehension of the site.

3.2 *Terra Sigillata*

Several fragments of *Terra sigillata* were collected on the site *Stella 1* since the excavations in the nineteen eighties. However they represent only a very small percentage of the recovered materials.
The small number of sherds bears a variability both in provenience and typology, ranging from North Italian to Gaulish workshops. This was the reason to suppose that this kind of objects belonged to the personal equipment of the crew and/or to the board-equipment, as part of daily-used goods[25].
A dish in North-Italian *Sigillata* was collected directly on the hull; recovered in good state of preservation, it has been identified as a *Conspectus 3* plate, bearing a stamp *in planta pedis* "*AL[BANI]*", OCK61. Both the shape and the stamp date around the middle of the 1st century AD[26], a chronology compatible with the one provided by stamped tiles and that, already at the time of the discovery, was thus extended to the whole archaeological evidence.

[25] *Bacino dello Stella*, p. 9; n. 1, p. 31 (n. inv. 118809).
[26] GOMEZEL 1992, p. 26.

134 *Terra Sigillata* fragments were collected within the area of scattered artefacts; after joining the matching sherds, the result is a minimum of 91 individual vessels. Among these, 59 fragments were identified as belonging to common types[27].

The study of *Terra Sigillata* materials, lying outside the purposes of the present work, has not been tackled in its entire complexity: the table below (see *table 2*) should be therefore taken into account only as a preliminary report, focused on the chronological insights provided by the sherds.

For detailed information, the results of a more comprehensive study are needed.

Find number	**Form**	**50 BC- 0**	**0-50 AD**	**50-100 AD**	**100-150 AD**	**150-200 AD**	**200 AD and later**
AP0651	Consp. 1 or 7	x					
AP1277	Consp. 1	x					
AP1628+AP1657	Consp. 1	x					
AP180	Consp. 13	x	x				
AP327+AP1197+ AP1289	Sarius Cup	x	x				
AP406	Sarius Cup	x	x				
AP420	Sarius Cup	x	x				
AP646	Sarius Cup	x	x				
AP713a	Sarius Cup	x	x				
AP713b	Sarius Cup	x	x				
AP739	Sarius Cup	x	x				
AP842	Sarius Cup	x	x				
AP843	Sarius Cup	x	x				
AP1020	Sarius Cup	x	x				
AP1325	Sarius Cup	x	x				

[27] Six extremely fragmentary objects could have not been recognised with certainty; their correct identification is thus still in doubt.

AP1347	Sarius Cup	x	x				
AP929	Consp. 14		x				
AP939	Consp. 26 (?)		x				
AP95	Consp. 20		x				
AP310	Consp. 20		x				
AP499	Consp. 5b		x				
AP39	Consp. 3		x	x			
AP128	Consp. 3		x	x			
AP78+AP97+ AP106+AP190+ AP204	Consp. 3 Stamp OCK 1757		x	x			
AP189	Consp. 27		x	x			
AP51	Consp. 34		x	x			
AP338	Consp. 20.4 (?)		x	x			
AP389	Consp. 34		x	x			
AP421	Consp. 20.4 or 29		x	x			
AP475	Consp. 3		x	x			
AP429+AP800	Consp. 34		x	x			
AP524	Consp. 3		x	x			
AP776	Consp. 34		x	x			
AP788	Consp. 51		x	x			
AP811	Consp. 4 (?)		x	x			
AP1044	Consp. 29		x	x			
AP1115	Consp. 20.4		x	x			
AP1172	Consp. 34		x	x			
AP1175	Consp. 27		x	x			
AP1221	Consp. 34		x	x			
AP1407	Consp. 34		x	x			
AP1487	Consp. 37.4 (?)		x	x			
AP1546	Consp. 34		x	x			
AP1559	Consp. 34		x	x			
AP1573	Consp. 26 or 27		x	x			

AP1685	Consp. 37.4		x	x			
AP436	Stamp OCK 1085		x	x	x		
AP77	Consp. 39 or 40			x	x		
AP1107	Consp. 43 (?)			x	x		
AP41	Consp. 39-44			x	x		
AP236	Consp. 39-44			x	x		
AP1571	ESB - *Atlante* 60			x	x		
AP458	Hayes 14/17				x	x	
AP23+AP229+ AP237	Hayes 14 B					x	
AP520	Hayes 14 B					x	
AP603	Hayes 14 B					x	
AP558	Hayes 5 C					x	
AP304	Hayes 5B or 14					x	
AP1004	Hayes 45						x

Table 2. Table of Terra Sigillata *types recognised among* Stella 1 *materials and their chronology (author's elaboration)*

Despite the majority is represented by only one sherd, a total of twenty-one different forms is attested (see *figure 6*); the great majority has to be dated to the 1st century AD.

The slightly earlier mould-made *Sarius* cups seem the most numerous. In all probability this is an overestimation; the homogeneity of both fabrics and slips makes it really difficult to assign non-matching fragments to the same vessel.

A similar situation is registered also for the form Hayes 14B, dated to the 3rd century AD.

In both cases it was decided to count each non -matching fragment as a single individual; further information will be needed in order to shed light on this peculiar situation.

The majority of *Terra Sigillata* fragments are dated to the 1st century AD but both earlier and later materials have been found in the same area.

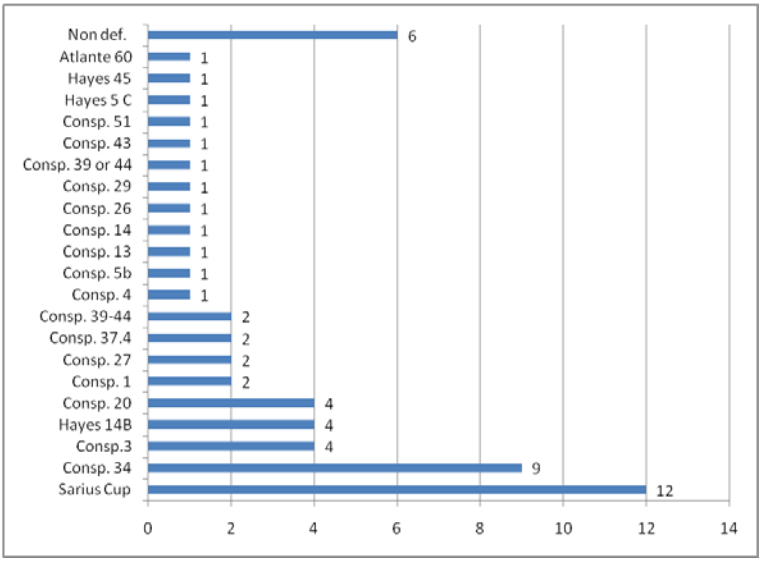

Fig. 6. Terra Sigillata: number of pieces for each identified form (author's elaboration)

The reason of this coexistence is still to be determined, although *terra sigillata* materials clearly do not belong to the cargo. The complete excavation of the area of scattered artefacts is going to provide further elements, essential to precise the chronology.

The low number of pieces already allows different main explanations: post-depositional causes, earlier frequentation of the site connected to the wood construction on the riverbank or later events occurred along the river banks.

No information could be retrieved looking at the distribution of materials in the area (see *figure 7*); *Terra Sigillata* fragments with different chronology are homogeneously spread all over within the stream of artefacts, hindering the possibility to identify any visible pattern.

However the high number of ceramics dated to the 1st century AD, and their constant presence within the area, reinforce the possibility of considering the whole stream as an homogenous context, broadly dated to the 1st century AD.

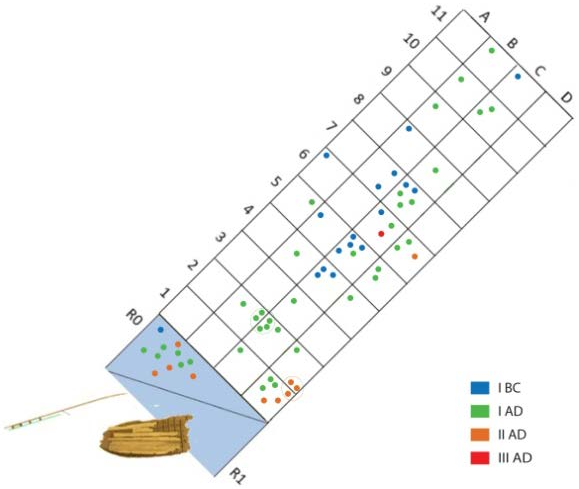

Fig. 7. Terra Sigillata: distribution of the identified vessels, divided by their chronology, in the area of scattered artefacts already investigated (author's elaboration)

3.3 Coins[28]

Sixteen coins have been collected within the area investigated during the 2013-2016 excavations .

Coins can usually provide precise chronological information. Unfortunately, the coins collected within the *Stella 1* site do not constitute an homogeneous group from a chronological point of view: eight coins belong to the first half of the 2nd century AD; four to the second half of the 1st century AD; four are even older, since are dated between the end of the Republican era and the early Augustan age (see *table 3* below).

[28] Coins found during the 2013-2016 excavation were identified and they are currently being studied by Professor Andrea Saccocci (University of Udine), to whom I am grateful for having shared with me this preliminary information.

Find number	Nominale	Emperor	2nd BC	30-0 BC	0-30 AD	30-70 AD	70 - 100 AD	100 - 140 AD	140 - 160 AD
AP1599	As	republican	x						
AP1198	As	undetermined		x					
AP384	As	Augustus		x					
AP1408	As	Augustus		x					
AP668	As	Vespasianus					x		
AP1000	As	Vespasianus					x		
AP290	Dupondius	Domitianus					x		
AP1052	As	Nerva					x		
AP1219	Sestertius	Trajanus						x	
AP1641	Sestertius	Hadrianus						x	
AP350	As	Hadrianus						x	
AP1051	As	Hadrianus						x	
AP1314	As	Hadrianus						x	
AP669	As	Hadrianus						x	
AP755	As	Antoninus Pius							x
AP1001	As	Antoninus Pius							x

Table 3. Coins from the area of scattered artefacts collected during 2013 - 2016 excavations and their chronology (author's elaboration)

It is unlikely that they had any connection to the hull; indeed it is worthy to stress that no one could be dated to the 1st century AD, i.e. the chronology assessed for the shipwreck also by radiocarbon dating. This could be explained also considering that the wreck happened in an area where the river bed is not too deep; it is thus likely that either the crew was able from the beginning to save the most precious objects, among which also the coins retrieved from the trade happened during the trip, or that valuable materials were immediately recovered, since the hull remain easily accessible.

Also the coins distribution inside the area does not seem to follow any regular pattern, since they are scattered all over in the area so far investigated (see *figure 8*).

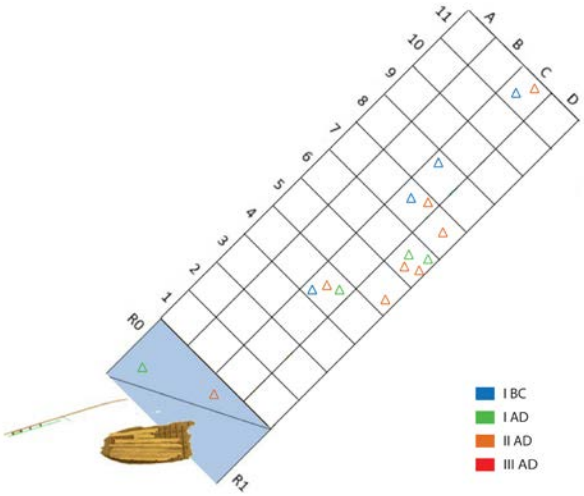

Fig. 8. Distribution of coins, divided by chronology, in the squares excavated during 2013-2016 campaigns (author's elaboration)

They could as well be dislocated offerings from people who crossed the upstream bridge, or they could have fallen in the river by chance. Therefore they do not provide any help in dating neither the wreck nor the broader contexts.

The majority of the coins, despite their chronology falls out from the general one, is more recent than the other finds. It is likely that later materials could have been thrown or lost in the water in a later period, as their random distribution seems to suggest; indeed the river remains always an open context.

Sixteen coins in 208 square metres are very few when compared to the massive presence of other materials. Perhaps further investigation will provide more information and will explain the relationship between coins and other finds and their apparently non-matching chronology.

3.4 Glass[29]

103 glass fragments were recorded from the *Stella 1* site; they belong to 73 objects, 36 of them could be dated.
Technological features of 18 objects suggest their contemporary chronology. Three finds are post-Roman objects: one fragment of glass fly-trap dating to the 19th century, one fragment of a post Medieval closed vessel, and one fragment of a Medieval stem glass.
Fifteen pieces could be recognised as belonging to ancient Roman glass objects[30] (see *table 4* below).

Find number	Form	Definition	1st C AD	2nd C AD	3rd C AD	4th C AD
AP1264	Bowl	Is. 3c	x			
AP164+AP995+ AP1007+ AP1038+AP1083+ AP1238	*Olla*	Is. 63/65	x	x		
AP775	Bowl/Dish	Is. 43	x	x		
AP435	Bottle	Is. 50	x	x	x	
AP771	Bottle	Is. 50	x	x	x	
AP783	Bottle	Is. 50	x	x	x	
AP1022	Bottle	Is. 50	x	x	x	
AP1023	Bottle	Is. 50	x	x	x	
AP70	Bottle	Is. 50/51	x	x	x	
AP90	Bottle	Is. 50/51	x	x	x	
AP235	Bottle	Is. 50/51	x	x	x	
AP1240	Bottle	Is. 50/51	x	x	x	
AP312	Bottom	non identified	x	x	x	x

[29] Glass and metallic objects are currently under investigation by Dr. Stefi Floreani whom I would like to thank for having shared with me the information provided above, results of her preliminary study of *Stella 1* materials.
[30] Six of the recovered pieces are matching fragments belonging to the same object.

AP313	Bottle	non identified	x	x	x	x
AP1067	Bottle/Jug	non identified	x	x	x	x

Table 4. Glass from the area of scattered artefacts collected during 2013 – 2016 excavations and their chronology (author's elaboration)

The Roman glasses recognised spans over four centuries, hindering the possibility to retrieve from them any further information to narrow the chronology of the entire deposit or even to connect them to the context of the shipwreck.

Assessing the distribution of the materials in the area of scattered artefacts proves to be even more complicated. Modern glass is homogenously spread all over the already excavated squares and, within the same zone, artefacts with very different chronology could be found side by side. (see *figure 9*).

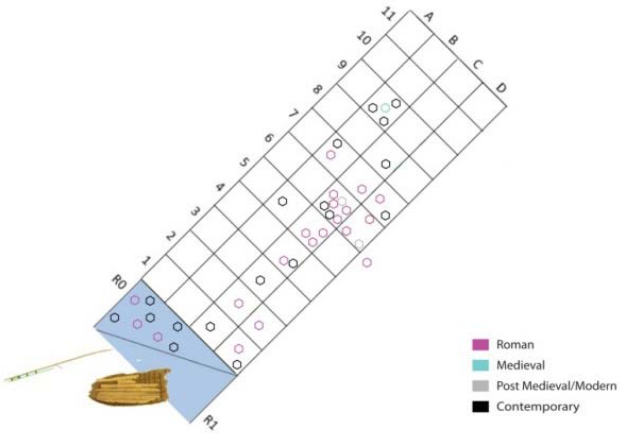

Fig. 9. Distribution of glass objects, divided by chronology, in the squares excavated during 2013-2016 campaigns (author's elaboration)

Unfortunately glass does not provide relevant information to deepen the comprehension of the site and to precise its chronology.

However a small number of glass artefacts is quite interesting. They date to the 1st century AD, sharing the same chronology with the

building materials and the majority of *Terra Sigillata* sherds. They could be therefore considered as belonging to the same context (whether it was constituted by only one ship or by more than one barge wrecked in the same area).

Nine fragments can be recognised as part of bottles; among them, five are surely square bottle of the *Isings 50* type. This type of bottle is one of the most widespread glass containers between the 1st and the beginning of the 3rd century AD[31]. Their squared shape and the not protruding handle make these bottles quite solid and compact. Therefore, beside their common use in the domestic sphere as tableware, they were also employed as transport containers as confirmed by evidence from Pompeii, where several *Isings 50* bottles were found in wooden boxes, ready to be transferred to other places. Obviously, they should have been used on medium-short commercial routes and/or for retail trade[32]. It is thus likely that also some of the fragments collected on *Stella 1* site originally belonged to the cargo.

Since *Isings 50* bottle could be used for a variety of function, they were produced in workshops widely distributed all over the Roman Empire; Northern Adriatic regions, and above all Aquileia, were surely among the productive centers of this kind of bottles.

In Northern Italy bottles *Isings 50* are commonly found along the main terrestrial and fluvial paths. Such high concentration is not necessary a sign of the existence of a local glass workshops but could be instead read as an evidence of their use as transport containers. Under this respects, fragments recovered within the *Stella 1* site can be considered as a further evidence of the commercial nature of the site. Furthermore, they also confirm the remarkable commercial vitality of the area.

One fragment of cup *Isings 3c*, dated to the early 1st century AD and one of *Isings 43*, dated to the 1st-2nd century AD, represent two of the most attested forms in North Eastern Italy.

Quite common, and dated as well to 1st-2nd century AD, is a recomposed handled jar, primarily used as household storage glass.

As in the case of *Terra Sigillata* vessels, the low number of these glass sherds and their extreme typological variability seem to suggest that

[31] ISINGS 1957, pp. 63-67.

[32] ROMAGNOLO 2013, p. 471.

they were not part of the cargo (with the possible partial exception of *Isings 50* bottles, as detailed above).
Like the two bottles discovered during the exploration in the nineteen nineties directly on the hull remains[33], they could have been part of the board equipment or they could have been personal belongings of the crew.

3.5 Metal objects[34]

Several metal objects have been recovered on the *Stella 1* site; only those relevant for chronological purposes will be considered here.
First rescue excavations at the end of the 20th century brought to light few bronze handles, pertaining to a number of vessels and interpreted as part of the board equipment. On the hull remains, an iron hatchet and an iron double-edged axe have been found, likely to be interpreted as part of the tools used for the daily maintenance of the ship and for simple wood-working activities[35].
The area of scattered artefacts yielded several metal objects. A total of 201 iron, lead and bronze fragments, pertaining to 153 objects, have been collected during the 2013-2016 underwater excavations.
134 of them are in iron, a feature that makes very difficult to determine their chronology, especially when combined to their poor preservation state: iron manufacturing technologies and daily-use tools remained almost unchanged from antiquity until very recent times. Indeed, a precise dating is quite impossible in the lack of any clear stratigraphic context or other indications. Rings, chains, metal sheets, needles or strings, even when well defined from a stratigraphic point of view, do not offer further dating clues, since they are long lasting, multiple-purposes objects.

[33] VITRI, BRESSAN *et Alii* 2003, p. 330.
[34] Also metal object are currently being studied by Dr. S. Floreani, who kindly provided the information here reported.
[35] VITRI, BRESSAN *at Alii* 2003, p. 330.

Construction and technological features define 8 objects as modern or contemporary and thus of no importance for the present analysis. The same can be said about the 95 iron nails, some of them fragmentary and some other completely preserved.

Of special interest for the economy on board is a copper beam belonging to a medium-size precision scale, a type well attested during the Roman era[36].

A series of incisions made at regular intervals divides the arm in twelve portions, following the Roman fraction system based on twelve. Beam dimensions and incisions suggest a maximum load of one *libra* (328 gr. *circa*) and an instrument's sensitivity of a *scripulum* or an *obolus* (1/24 and 1/48 part of a *libra* respectively). It was a high precision scale, used to weight very precious goods or to check the validity of coins. Its presence within the *Stella 1* materials is quite surprising, since the cargo seems to be composed primarily of building materials. Nevertheless, the scale is a sound evidence of the commercial transactions that took place during the sailing, not restricted to the ship final destination.

Another interesting and unusual object is a little lead mirror whose reflecting surface consists of a convex glass. It is a mould-made mass-produced object, with a-very simple incised decoration. Objects like this were quite common during Roman times and are well attested from the 1st to the 4th century AD, mostly in votive and funerary contexts. Its presence within the *Stella 1* context can be explained considering it as part of the personal belonging of a crew member.

Among the objects dated to the Roman time there are also a gold-plated bronze *ligula*[37], a bronze bracelet[38] and four iron keys for pin tumbler locks, two of them found still connected to each other by means of an iron chains. All these six finds were not part of the cargo although it is not clear whether they should be interpreted as personal belongings of the crew or external materials thrown in the river in an earlier or later moment, and in no relation with the ship.

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[36] *Data* here presented are retrieved from a recently published paper about the *Stella 1* copper beam; see CAPULLI, FLOREANI 2016 (and mentioned bibliography) for further information.

[37] *Ligulae* were ancient Roman little spoon, used for multiple purposes.

[38] For its specific technological and morphological features, it can be dated to the 3rd-5th century AD (information provided by Dr. S. Floreani).

Finally, a completely detached intrusion is a *fibula* of the *Hübener* 4 type. This kind of *fibula* is well attested in the central-Eastern Alpine arch between the 7th and the 8th century AD, thus clearly demonstrating that the *Stella*/*Anaxum* river was still frequented after the end of the Roman Empire.

3.6 Lamps[39]

Among the ceramic materials collected in the area of scattered artefacts eleven fragments belonging to ten Roman lamps have been identified.
Four are in such a fragmentary state that it was not possible even to suggest a possible identification.
Two volute lamps are dated to the 1st century AD, confirming once again the homogeneity of the archaeological deposit.
The other four have been identified as *Firmalampen* of the *Buchi Xb* type, a common type in North-Eastern Italy, attested for a long period between the end of the 1st century AD and the 3rd century AD[40].
Two of them are completely preserved and bear the producer's stamp, still well readable on the bottom.
In the first case the stamp consists of only three letters *QGC*; as usual for lamps made by this potter, also the *Stella 1* lamp is smaller than the average for the type. The stamp linked this object to the production of a North Italian maker, whose workshop, possibly located in nowadays Veneto, was active between the middle of the 2nd and the end of the 3rd century AD[41]. The peculiar characteristics of the lamp suggest that it belongs to the second/third generation of *sourmolage*, enabling to narrow the chronology to the end of the 2nd century AD.

[39] As in the case of *Terra Sigillata*, also lamps have not been completely studied. *Data* here presented should be taken into account only as a preliminary report, resulted from a generic overview mainly aiming at determining the chronology of the archaeological deposit.
[40] BUCHI 1975, p. XXXII.
[41] DI FILIPPO BALESTRAZZI 1987, p. 451.

The other lamp completely preserved shows on the bottom the stamp *VIBIANI*, related also in this case to a North-Italian ceramic workshop active between the end of the 1st century AD and the beginning of the 3rd AD[42].
Unfortunately, in this case, no further information can be retrieved from both the shape of the object and the letters features so that the stamp, related to a workshop whose production lasted over a long period, is not useful to narrow the chronology of the lamp.
Lamps collected in the area of scattered artefacts therefore turned out to be useless to better define the chronology of the area of scattered artefacts.
However, since the majority of them were in use in the 1st century AD, it is likely that at least some of them belong to an homogeneous context, related to the wreck. In this last case, given their low number, they should be considered as part of the board-equipment and not as items belonging to the cargo.
They are thus not useful to further determine and assess the direction and composition of trade occurring along the river *Stella*/*Anaxum*, since by no means they could be considered traded goods.

3.7 Amphorae[43]

First explorations in the nineteen eighties brought to light several fragments of wine amphorae of the *Lamboglia 2* and *Dressel 2-4* types. *Lamboglia 2* amphorae were produced in Northern Adriatic Italy from the beginning of the 1st century BC; *Dressel 2-4* amphorae were instead manufactured in different areas of the Roman Empire, between the middle of the 1st century BC and the beginning of the 2nd century AD.

[42] BUCHI 1975, p. 61.
[43] A preliminary study of *Stella 1* amphorae was realised by Dr. E. Braidotti. Since research are still ongoing, *data* here presented should be considered only as a preliminary overview.

Fabric characteristics of *Stella 1* sherds enabled their identification as local productions[44].

Fragments of the same shapes were brought to light during the excavations in the nineteen nineties; these campaigns added to the types already attested also some flat-bottomed amphorae.

The low number of amphorae fragments collected during the rescue excavations led archaeologists to hypothesize that they were part of the board equipment, in secondary use as drinking water storage containers for the crew. However, they could also be part of the cargo; in this case, they would have carried wine[45].

Within the area of scattered artefacts, amphorae are mainly represented by non-diagnostic fragments. Indeed, since the site remained unguarded for over twenty years, it is likely that the biggest and most recognisable diagnostic materials have been illegally removed.

Nevertheless, if we exclude bricks and tiles, among the materials collected during the 2013-2016 excavations, amphorae have been the most frequent finds (see *figure 1*). In the area of scattered artefacts, the archaeologists of the *Anaxum Project* have found a large variety of amphorae, even larger than in previous research on the site[46].

The majority belongs to wine amphorae *Dressel 2-4* and *Forlimpopoli* type; wine or fish sauce amphorae *Dressel 6A* type and oil amphorae *Dressel 6B* type are as well frequent. They are all dated to the 1st century AD, confirming the general chronology of the site, and they testify the trade of a variety of perishable goods.

Among the collected fragments, there is a *Dressel 6B* handle with the stamp *AELI. CRIS*, testifying the production of Loron in Istria, where a great estate with an huge productive centre has been identified and whose investigation is still ongoing[47].

The stamp provides chronological information, since it is dated to Loron production phase between 50 and 60 AD . In case it was not in secondary use, it would represent a further element indicating the 1st century AD as the most likely dating for the archaeological deposit.

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[44] GOMEZEL 1992, p. 26.

[45] VITRI, BRESSAN *et Alii* 2003, p. 330.

[46] I would like to thank Dr. E. Braidotti who shared with me this preliminary information.

[47] MARION, STARAC 2001, pp. 103-104.

Furthermore, the presence of this stamp among the *Stella 1* materials bears evidence for the composite nature of the cargo, surely made up by products with different provenance. As already suggested by bricks and tiles, it is highly likely that the cargo composition changed along the course of the trip, in a continuous exchange of the traded goods.
The *Stella 1* amphorae include a number of earlier materials, mainly *Lamboglia 2* type as the ones recovered directly above the hull. Also late Roman fragments of *Keay 25*, dated between the end of the 3rd century AD and the middle of the 5th century AD , as well as *Late Roman 3* amphorae, attested between the 4th and the 8th century AD have been identified. Given their low number, they have to be considered as intrusive or residual materials.

3.8 Other ceramic materials

Rescue excavations at the end of the 20th century found directly on the hull a restricted number of fragments belonging to common ware pitchers, jugs and *ollae*, interpreted as part of the board equipment[48].
Also in the area of scattered artefacts fragments belonging to other ceramic materials were recovered.
Limited to very few non-diagnostic samples, they were more likely part of the board equipment and not of the cargo. Since they offer information neither for the chronology nor for the nature of the deposit, they will not be considered in the present work.
A partial exception, worthy of mention for both its rarity and its chronological value, is a trefoil *olpe*, almost entirely preserved, bearing on the shoulder a painted decoration.
Olpai of this type have been so far identified only in a small number of sites; first samples were found in Cremona[49], while fewer artefacts were unearthed in Calvatone[50], Adria[51], Aquileia and its surroundings[52].

[48] VITRI, BRESSAN *et Alii* 2003, p. 330.
[49] Materials unearthed in Cremona could be dated between the 2nd and the end of the 1st century BC. See RAGAZZI, FRONTORI 2018, pp. 35-36, tav. V, nn. 1-2, 5.
[50] See PONTIROLI 1974, pp. 64, 95, 207, 313, tavv. XLVIII e CLVIII.

Trefoil decorated *olpai* were recovered also in *Poetovio*[53] and more than one hundred samples were found on the Magdalensberg settlement[54].
Overall, these materials started to be produced in the 2nd century BC, while samples from the Magdalensberg, dated to Tiberian-Claudian age, confirmed that the manufacturing and trade of this kind of artefacts continued also in the early imperial period.
The presence of one well-preserved sample of painted *olpe* within the *Stella 1* site further assess the chronology of the site to the 1st century AD and, moreover, gives a clue on the distribution patterns of these materials, so far attested only by a restricted number of samples.

3.9 The area of scattered artefacts: concluding remarks

Despite several questions regarding the nature and chronology of the area of scattered artefacts still remain open, the overview provides a sound argument to consider this underwater concentration of materials as a homogenous context. Also its relationship with the materials previously collected directly on the hull is clear, since the composition of the two assemblages is very similar.
In both cases the majority of artefacts recovered are bricks and tiles; they constituted the bulk of the cargo, thus suggesting that the waterways was a privileged trade routes for heavy loads.
Materials within the area of scattered artefacts and the ones from the hull shared also a comparable chronology.

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[51] I would like to thank Dr. V. Mantovani, who is currently studying materials from the excavation in Adria-Via Retratto, and who shared with me this information.
[52] A number of painted *olpai* were unearthed during the excavation of the pottery kiln located in the Northern *suburbium* of the city, in the so-called area of Monastero (see BUORA 2015, p. 27); other examples were found within the *Canale Anfora* (see MIAN 2017, pp. 204-205, fig. 38.6).
[53] See MIKL CURK 1976, *passim*.
[54] See the most recent update in SCHINDLER KAUDELKA, MANTOVANI 2018.

The table below (*table 5*) lists the materials so far analysed from which it was possible to retrieve chronological information. Without taking into consideration the class they belong to, artefacts are presented merely according to their chronology. The table shows at glance that the majority of the dated objects recovered within the area of scattered artefacts could be dated to the 1st century AD, a chronology already suggested in the nineteen nineties for the barge and that further matches also the results provided by the radiocarbon dating of the hull.
As further proved by the most recent radiocarbon dating of the hull, this first overview of the materials allowed to further defined the overall chronology of the site, whose starting date should be shifted to the second half of the 1st century AD.
Earlier materials are very few and consist merely of coins and a restricted number of *Terra Sigillata* sherds, artefacts that could have joined the archaeological deposit by change, without having any link with the bulk of materials.
A higher number of artefacts has a later chronology, up to the 4th century AD, and materials dated till the Modern era were identified, especially within metal and glass objects.
They are scattered all over the archaeological deposit, and their presence could be explained with the nature of the *Stella 1* site that remains an open context, exposed to the perennial flow of the river that continuously mingles and mixes ancient and modern artefacts.
On the other side, the presence of some later materials is an interesting clue about the importance of the *Stella/Anaxum* river, whose banks have always been inhabited and frequented, and whose water-flows continued to be exploited also after Roman times.
The overview of the materials unearthed within *Stella 1* site, whose chronological value is summarised in table 5, confirmed the homogeneity of the archaeological deposit and contribute to assess its overall chronology to the early Imperial time, suggesting that earlier and later artefacts, given their residual number, could be considered residual or intrusive materials.
Furthermore, an high number of 1st century AD artefacts, included also some coarse ware materials, as it is going to be demonstrated in the

next chapters, was identified as a likely production of the *Stella/Anaxum* basin.

This is a further proof that the *Stella 1* site offers enough evidence to be a privileged source of information for the reconstruction of the economic system of the *Stella/Anaxum* basin, placed in the broader framework of the Aquileia's territory and therefore connected to the general economic pattern reared by the Roman Empire.

Class	**Number**	**Form**	**2nd BC**	**50 BC -0**	**0-50 AD**	**50-100 AD**	**100 - 150 AD**	**150 - 200 AD**	**3rd AD**
Coins	AP1599	As	x						
Coins	AP1198	As		x					
Coins	AP384	As		x					
Coins	AP1408	As		x					
Terra Sigillata	AP651	Consp. 1 or 7		x					
Terra Sigillata	AP1277	Consp. 1		x					
Terra Sigillata	AP1628+ AP1657	Consp. 1		x					
Stamped Brick	AP197	M. ALBI MACRI			x				
Stamped Brick	AP200	M. ALBI MACRI			x				
Stamped Brick	AP203	M. ALBI MACRI			x				
Stamped Brick	AP1530	M. ALBI MACRI			x				
Stamped Brick	AP202	M.ALBI RVFI			x				
Stamped Brick	AP866	M.ALBI RVFI			x				
Stamped Brick	AP903	M.ALBI RVFI			x				

Stamped Brick	AP1098	M.ALBI RVFI			x				
Stamped Brick	AP1285	M.ALBI RVFI			x				
Stamped Brick	AP1507	M.ALBI RVFI			x				
Stamped Brick	AP1676	M.ALBI RVFI			x				
Stamped Brick	AP417	EPIDIORV M C.M.			x				
Stamped Brick	AP639	EPIDIORV M C.M.			x				
Stamped Brick	AP1513	EPIDIORV M C.M.			x				
Stamped Brick	AP1629	EPIDIORV M C.M.			x				
Stamped Brick	AP246	L. EPIDIUS THEODOR US			x				
Stamped Brick	AP964	L. EPIDIUS THEODOR US			x				
Stamped Brick	AP467	C.TITI.HER MEROT			x				
Stamped Brick	AP655	C.TITI.HER MEROT			x				
Stamped Brick	AP746	C.TITI.HER MEROT			x				
Stamped Brick	AP934	C.TITI.HER MEROT			x				
Stamped Brick	AP1150	C.TITI.HER MEROT			x				
Stamped Brick	AP1681	C.TITI.HER MEROT			x				
Stamped Brick	AP15	VALERIAE MAGNAE EPIDIAN			x				
Stamped Brick	AP130	VALERIAE MAGNAE EPIDIAN			x				
Stamped Brick	AP201	VALERIAE MAGNAE EPIDIAN			x				

Stamped Brick	AP232	VALERIAE MAGNAE EPIDIAN			x				
Stamped Brick	AP464	VALERIAE MAGNAE EPIDIAN			x				
Stamped Brick	AP1112	VALERIAE MAGNAE EPIDIAN			x				
Stamped Brick	AP546	L.ST(ATI) IVSTI			x				
Stamped Brick	AP1090	L.ST(ATI) IVSTI			x				
Terra Sigillata	AP929	Consp. 14			x				
Terra Sigillata	AP939	Consp. 26 (?)			x				
Terra Sigillata	AP77	Consp. 20			x				
Terra Sigillata	AP310	Consp. 20			x				
Terra Sigillata	AP499	Consp. 5b			x				
Stamped Brick	AP352	ABVDI			x	x			
Lamp	AP880	Volute Lamp			x	x			
Lamp	AP1021	Volute Lamp			x	x			
Terra Sigillata	AP39	Consp. 3			x	x			
Terra Sigillata	AP128	Consp. 3			x	x			
Terra Sigillata	AP78+ AP97+ AP106+ AP190+ AP204	Consp. 3 Stamp OCK 1757			x	x			

Terra Sigillata	AP189	Consp. 27			x	x			
Terra Sigillata	AP51	Consp. 34			x	x			
Terra Sigillata	AP338	Consp. 20.4 (?)			x	x			
Terra Sigillata	AP389	Consp. 34			x	x			
Terra Sigillata	AP421	Consp. 20.4 or 29			x	x			
Terra Sigillata	AP475	Consp. 3			x	x			
Terra Sigillata	AP429+ AP800	Consp. 34			x	x			
Terra Sigillata	AP524	Consp. 3			x	x			
Terra Sigillata	AP776	Consp. 34			x	x			
Terra Sigillata	AP788	Consp. 51			x	x			
Terra Sigillata	AP811	Consp. 4 (?)			x	x			
Terra Sigillata	AP1044	Consp. 29			x	x			
Terra Sigillata	AP1115	Consp. 20.4			x	x			
Terra Sigillata	AP1172	Consp. 34			x	x			
Terra Sigillata	AP1175	Consp. 27			x	x			
Terra Sigillata	AP1221	Consp. 34			x	x			

Terra Sigillata	AP1407	Consp. 34			x	x			
Terra Sigillata	AP1487	Consp. 37.4 (?)			x	x			
Terra Sigillata	AP1546	Consp. 34			x	x			
Terra Sigillata	AP1559	Consp. 34			x	x			
Terra Sigillata	AP1573	Consp. 26 or 27			x	x			
Terra Sigillata	AP1685	Consp. 37.4			x	x			
Glass	AP1264	Bowl Is. 3c			x	x			
Lamp	AP274	*Firmalampe* Xb				x			
Coins	AP668	As				x			
Coins	AP1000	As				x			
Coins	AP290	Dupondius				x			
Coins	AP1052	As				x			
Glass	AP164+ AP995+ AP1007+ AP1038+ AP1083+ AP1238	Olla Is. 63/63			x	x	x	x	
Glass	AP775	Bowl Is. 43			x	x	x	x	
Terra Sigillata	AP436	Stamp OCK 1085			x	x	x		
Terra Sigillata	AP77	Consp. 39 or 40				x	x		

Terra Sigillata	AP1107	Consp. 43 (?)				x	x		
Terra Sigillata	AP41	Consp. 39-44				x	x		
Terra Sigillata	AP236	Consp. 39-44				x	x		
Terra Sigillata	AP1571	ESB Atlante 60				x	x		
Coins	AP1219	Sestertius					x		
Coins	AP1641	Sestertius					x		
Coins	AP350	As					x		
Coins	AP1051	As					x		
Coins	AP1314	As					x		
Coins	AP669	As					x		
Terra Sigillata	AP458	Hayes 14/17					x	x	
Coins	AP755	As						x	
Coins	AP1001	As						x	
Terra Sigillata	AP23+ AP229+ AP237	Hayes 14 B						x	
Terra Sigillata	AP520	Hayes 14 B						x	
Terra Sigillata	AP603	Hayes 14 B						x	
Terra Sigillata	AP558	Hayes 5 C						x	

Terra Sigillata	AP304	Hayes 5B or 14						x	
Lamp	AP477	*Firmalampe* Xb				x	x	x	x
Lamp	AP671	*Firmalampe* Xb				x	x	x	x
Lamp	AP1200	*Firmalampe* Xb				x	x	x	x
Glass	AP435	Bottle Is. 50			x	x	x	x	x
Glass	AP771	Bottle Is. 50			x	x	x	x	x
Glass	AP783	Bottle Is. 50			x	x	x	x	x
Glass	AP1022	Bottle Is. 50			x	x	x	x	x
Glass	AP1023	Bottle Is. 50			x	x	x	x	x
Glass	AP70	Bottle Is. 50/51			x	x	x	x	x
Glass	AP90	Bottle Is. 50/51			x	x	x	x	x
Glass	AP235	Bottle Is. 50/51			x	x	x	x	x
Glass	AP1240	Bottle Is. 50/51			x	x	x	x	x
Terra Sigillata	AP1004	Hayes 45							x

Table 5. Dated materials from the area of scattered artefacts.
The comparative table shows how the majority of them could be dated to the 1st century AD (author's elaboration)

Chapter 4

Coarse ware studies: current achievements, open issues.

4.1 Coarse ware studies, from the first research to the newest approaches

Coarse ware represents one of the most commonly finds on every archaeological sites[1]. This type of material, though, has been highly neglected in archaeological research until the second half of the last century, when it was recognised as an uniquely, precious source of information about a number of crucial aspects of ancient human communities, such as eating and living habits, technological knowledge and practices, organization of production and trades, as well as circulation of instruments, goods and people[2].
Given this state of 'infancy' of coarse ware studies, literature on the topic is not so broad and publications are rarely comprehensive, especially when compared to the scholarly works devoted to other materials that benefit from a long-lasting research tradition.

[1] OLCESE 1993, p. 46.
[2] SANTORO BIANCHI 2003, p. 327.

A further great difficulty arises in the attempt of tracing all the relevant contributions, since often authors refer to coarse ware using a wide variety of different denominations[3].

The following pages offer an overview of the most important studies on coarse ware. Even though the international scholarly framework is taken into account, the highest attention is devoted to publications of coarse ware materials from Italian archaeological sites, with a major focus on ancient Roman sites, as they are of particular interest for the purposes of the present research. For this reason, important works on common and coarse ware that are not related to Italian sites, or to the Italian debate on the topic, are not considered here.

Until the second half of the 20th century, the prevailing aesthetic approach to archaeology made pottery studies mainly focus on fine ware, as the only type of pottery worth of conservation and attention. Coarse ware, instead, was generally discarded during excavations and often not even mentioned in the published excavation reports.

In this cultural context, the publication of the Ventimiglia - *Albintimilium* excavations by Nino Lamboglia in 1950[4] could be considered as an early, albeit modest, change of direction. Introducing a new methodology, Lamboglia decided to study and publish all the materials brought to light during the stratigraphic excavations of the ancient Roman city, firmly believing that every single sherd, despite its small dimensions and its apparent worthlessness, has an intrinsic value and bears meaningful information. The author isolated, within the common ware (*ceramica comune*), a group of materials that he called *rozza terracotta scura*, comprehending all coarse ware fragments. Even though Lamboglia still considered coarse ware as a subclass of common ware, he clearly distinguished the two, precisely describing coarse ware main features, i.e. the restricted number of morphological variants and the *longue durée* of the identified shapes.

Lamboglia's innovative approach gave birth to a new *wave* in pottery studies. From this moment on, a growing number of scholars started

[3] This lack of a shared vocabulary is still among the main problems affecting coarse ware studies worldwide. An overview of the most used denominations will be provided in chapter 4.4, pp. 106-114.

[4] LAMBOGLIA 1950.

devoting space to coarse ware within their publications, although considering it within the broader group of common ware, comprehending kitchenware, tableware and storage vessels.
Among these pioneering studies, it is worthwhile recalling the publication of the pottery brought to light during the excavations of the so-called *Terme del Nuotatore* in the ancient Roman city of Ostia Antica[5].
These pioneering studies played a crucial role in raising consciousness of the relevance of this class of material and in elaborating a first typology of its shapes; apart from this, they let emerge a conviction that would soon become largely accepted, namely that common ware was mostly locally produced and did not circulate across regional borders.
In regard to this specific aspect, the publication of Mercedes Vegas' 'handbook', *Cerámica común romana del Mediterráneo Occidental,* in 1973 represents a real turning point. As stated at the beginning of her work, the author explicit aim is to create a typology suitable for the whole Western Mediterranean region, acknowledging the supra-regional diffusion of some shapes, attested by their presence all around the Roman Empire[6].
In order to support this assumption, Vegas studied materials discovered in several sites scattered on the Mediterranean shores from Italy to Spain, but linked to each other by known maritime trades.
Vegas's work results in a typology based on functional distinctions[7], within which coarse ware, although considered within the broader group of common ware, is highly represented.
A similar functional classification was adopted by S.L. Dyson in the publication of pottery found in *Cosa*[8]; separating *kitchen, domestic* and *coarse ware*, the author considered for the first time this kind of pottery as an autonomous class, distinct from common ware. Dyson, paying attention to pottery technological features, characterised also ceramic fabrics, describing the presence, nature and size of inclusions, the colour of the body, considered as an indicator of firing atmosphere and

[5] *Ostia III*.
[6] VEGAS 1973, p. 2.
[7] Vases are divided in cooking ware, table ware, storage ware, perfume vessels and *varia*. See VEGAS 1973, pp. 7-9.
[8] DYSON 1976.

temperature, and the eventual presence of every sort of slip or covering on the surface. Dyson, flanking morphological classification by fabrics description and macroscopic analysis, applied for the first time to Italian materials an approach conceived and mainly followed in English-speaking countries, since the first half of the 19th century.

The long tradition of this approach in English-speaking countries is indeed documented by precocious comprehensive publications about archaeological ceramic that devote a substantial space to the technological aspects of pottery production[9]. This focus on ceramic technology and fabric characterization, sometimes even regardless of morphological features, allows scholars to take into consideration not only diagnostic fragments, but every single sherd, leading to a more comprehensive analysis of pottery assemblages. A telling example of this could be found in the edition of the archaeological excavations of the British Mission in *Carthage*[10], whose authors widely explained the reasons behind this approach. Indeed, from the beginning, researchers in English-speaking countries did not aim to create chrono-typological seriations but, moving from an historic-anthropological background, they meant to understand places of production and commercial itineraries followed by pottery, several decades before Italian scholars started to deal with these issues.

After Dyson's work, the attention to technological aspects of pottery production found its most important Italian actualization in the publication of Luni - *Luna* excavations, which was carried out by the Ligurian Superintendence for Antiquity with the cooperation of University of Milan and the Italian CNR in the nineteen seventies[11]. Within the framework of this huge research process, selected sherds were analysed by T. Mannoni in thin sections, taking advantage of the progress made by archaeometric research.

The very decision of processing coarse ware through archaeometric analysis widely testifies that a general agreement had been reached

[9] One of the first publications, still a milestone in pottery studies, is P.M. Rice, *Pottery Analysis. A sourcebook,* devoting several pages to pottery production, with a particular attention to coarse ware technologies, just to mention maybe the most known work in this field.

[10] FULFORD, PEACKOK 1984.

[11] *Luni I, Luni II.*

regarding this class informative potential: furthermore, the results of these studies completely changed paradigms, methodologies and expectations characterizing the investigation of this kind of material until that moment.

An example of the impact of the *Luna* project, was the identification, thanks to thin sections analysis of *Luna* coarse ware, of certain specific fabric, whose mineralogical composition did not correspond to the geological composition of the surrounding environment. Furthermore, certain petrological components suggested a compatibility with geochemical elements proper of other regions, both in Italy and beyond. Thus, contrasting the common knowledge that coarse ware was mainly locally produced and distributed, thin sections of Luni - *Luna* artefacts provided the first scientific evidence that some coarse products were traded across local and regional borders[12].

On the other side, acknowledging differences within this group, Mannoni proposed to change the definition from *ceramica comune* (common ware) into *ceramiche di uso comune* (ceramics of everyday uses), underlying that all these potteries could be grouped as a class according to *criteria* of function and low costs while, on the other side, they could present substantial differences in shape, fabric, attributes, *etc*.

This new definition was soon accepted by the authors of the publication of the Roman *villa* at *Settefinestre*, in Southern Etruria, excavated between 1976 and 1981 and published in three volumes in 1985[13].

Here, coarse and common ware are still grouped together; however, materials are divided, according to their function, in kitchen ware (*ceramica da fuoco*), storage ware (*ceramica da dispensa*), pottery for washing and pottery for general domestic purposes. In presenting these functional distinctions, the authors claim that they need to create a made-on-purpose classification, since the already existing ones turned

[12] The results of coarse ware fabric analysis, with a description of the petrological groups identified and a definition of locally produced or imported vases is mainly addressed in *Luni II*, pp. 616-629.

[13] *Settefinestre 1*-1** and 2*.

out to be not compatible and/or not comprehensive of all the materials unearthed in the Roman *villa*[14].

Even though no archaeometric analysis were carried out for the publication, fabric features are described on the basis of macroscopic observation. Following the growing literature of the time, several features were taken into consideration in order to distinguish between different fabrics, i.e. colour (described with the Munsell code), hardness, feeling of sherds' surfaces when rubbed with the thumb, and shape of the fracture. Moreover, presence, type, size, distribution, shape and frequency of inclusions were observed and described. Twenty different common ware fabrics were isolated; in certain cases the distinction between local and imported products is indicated, mainly on the basis of the nature of the identified inclusions[15].

From the nineties eighties onward, pottery studies were characterised by a new approach. Overcoming the old idea that pottery can merely serve as a dating tool, every sherd started to be considered as a potential bearer of useful information about ancient societies, from technological know-how, to production organization, to long and short-distance trade[16] .

A result of this more comprehensive approach could be seen in the publication by Donato Labate of the pottery finds preserved in the Civic Archaeological Museum of Modena [17]. Recognising the variety of information that could be retrieved from ceramics, the author

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[14] The reasons behind the choice of a customized functional typology are clearly stated by the author in presenting the classification, see PAPI 1985, p. 94: "*Durante la schedatura e la classificazione dei materiali non è stato possibile fare riferimento ad altre tipologie perché risultavano o incomplete (Vegas 1973) o pertinenti a materiali di siti distanti, attribuibili, in parte, a una produzione locale (Ostia I-IV, Luni I e II) o poco chiare nella descrizione e nella documentazione grafica dei tipi (Dyson 1976)*".

[15] All the observations on pottery fabric, made by D. Cirone e C. Colletti, have been inserted, among the *appendices*, at the end of the second volume of the publication, where the 20 identified fabrics are presented in easy-to-read tables. *Settefinestre 2*, pp. 330-331.

[16] A telling proof of the acknowledgment of the informative potential of every kind of evidence of material culture brought to light during archaeological investigations can be read in CARANDINI 1975, p. 108: "*Il manufatto per eccellenza 'normale' (l'oggetto di uso comune) e il manufatto per eccellenza 'cerimoniale' sono due facce di una stessa medaglia, cariche ambedue di uno stesso e pur diverso valore di rappresentatività socio-economica*".

[17] LABATE 1988.

acknowledged coarse ware as a group *per se*. Indeed, even if he handled both, he clearly distinguished coarse ware (for which he adopted the definition of *rozza terracotta scura*, already used by Lamboglia and Mannoni) and common ware, creating for each of them a customized typology. The classification created by Labate is mostly a morphological one, but he made deep observations on pottery fabrics, although described only macroscopically.
In comparing Modena materials with other coarse ware unearthed all around Italy, he made an attempt to explain similarities in terms of mutual influences, commercial dynamics, adoptions of new eating habits, thus trying to exploit coarse ware informative potential for more complex economic and social analysis.
The nineteen eighties were a period of flourishing for ceramic studies, that started to fully benefit from the aid provided by new technologies. On the one side, archaeometric analysis, especially thin section microscopic examinations, became more and more frequently used; on the other side, the development of computer technologies and their increased accessibility, equipped archaeologists with powerful tools for data management and processing[18].
However, it has to be noticed that, from this very beginning, coarse ware studied suffered, at least in Italy, from a sharp distinction between Roman and Late Antique productions on one side, and Medieval materials on the other. The development of these two distinct branches, however as useful as it can be, prevented, until very recent times, from the identification of elements of continuity between these productions and the appreciation of the constant evolution in coarse ware manufacturing over the centuries.
These issues have been faced for the first time during the International Congress *La ceramica medievale nel Mediterraneo Occidentale*, organised by the University of Siena and the Faenza International Museum of Pottery in 1984 and these concerns are widely expressed in the conference proceedings[19].

[18] A brief introduction on this topic and a short list of contemporary publication adopting these methods can be found in OLCESE 1993, p. 51.
[19] See particularly BROGIOLO, GELICHI 1986.

The problem has been clearly stated some years later by Sara Santoro Bianchi, in the presentation of the new methodology developed for the study of coarse ware collected at the site of Castelraimondo di Forgaria (UD) [20].

However, this is only one among the problems that affected coarse ware studies in a moment of greater achievements in pottery research; just to mention the main issues, one could underline that, despite Labate's first attempt, other contemporary publications still considered coarse ware as a chronologically useless subgroup of common ware.

Coarse ware was inserted in the broad class of common ware also in the publication of ceramic finds from Calvatone - *Bedriacum*, in other perspective a milestone in common ware studies. Indeed authors adopted a comprehensive methodology in the analysis of ceramic materials, aiming at the identification of relationships among common ware technological features, functional destination, and provenience[21].

Coarse ware is still classified within the wider group of common ware in the publication of the excavations done in Milan during the construction of the Underground[22]. Despite this restriction, these volumes are still fundamental because, handling materials recovered in different sites all around the city, the authors decided to develop a new typology for coarse ware, based on both morphological and technological *criteria*. The result is a chrono-typological classification

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[20] See SANTORO BIANCHI 1990, p. 377: "*Lo studio della ceramica grezza romana e medievale si è sviluppato dalla fine degli anni '60 su due diversi indirizzi di ricerca che hanno tenuto separate le due fasce cronologiche, spesso senza alcun confronto reciproco, spezzando artificiosamente quella straordinaria continuità di tradizione artigianale che è una delle caratteristiche principali di questo materiale*".

[21] Indeed common ware from *Bedriacum*-Calvatone has been divided in three groups according to their fabric features, related to their functions: vases with coarser inclusions were used for cooking purposes, as suggested by traces of fire exposure; a pottery fabric characterised by smaller inclusions is typical of storage ware; coarse ceramic made with more fine clay composition, and sometimes covered with an *engobe* was used as table ware.

Furthermore, while coarser ceramic could have been produced also in a regime of household activities, finer ware required more structured workshops, and should have been produced in structured *figlinae* (For the most comprehensive study about common ware from *Bedriacum*-Calvatone, see DELLA PORTA 1991).

[22] *Scavi MM3*.

that, for the first time, allows the identification of evolutional *phenomena* in coarse ware production.
The identification of *phenomena* of similarities and continuity is achieved, even in a broader framework, in the volume *Ceramiche in Lombardia tra II secolo a.C. e VII secolo d.C. Raccolta dei dati editi*[23], containing a general overview of published ceramic findings unearthed in several Northern Italian sites, located in a broad area between the base of the Alps and the Po valley. However, even in this case, coarse ware is still considered within the wider class of common ware.
Furthermore, as this overview suggests, in these pioneering studies, and only with partial exceptions[24], attention was mainly focused on Central and Southern Italy and the Tyrrhenian sea coasts, due to a deeper and long lasting tradition of pottery studies in these territories[25]. This turned out to be true also in the nineteen nineties, inaugurated by an essential publication by Gloria Olcese, *Le ceramiche comuni di Albintimilium. Indagine archeologica e archeometrica sui materiali dell'area del cardine*[26].
Updating the work edited by Lamboglia on common ware from Ventimiglia - *Albintimilium*[27], the author fully exploits coarse ware informative potential, benefitting from her composite background in both archaeology and archaeometry. Materials were indeed classified according to both morphological and fabric features; furthermore, some selected samples were analysed through archaeometric techniques, in order to isolate, within the broader group of common ware, homogenous fabric groups and to identify possible areas of production[28].

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[23] From this moment on, simply *Ceramiche in Lombardia*.
[24] In addition to the studies on coarse ware from *Bedriacum* - Calvatone, Milan and in general from Lombardia, a sporadic attention has been paid, in the last decades of the 20th century, to pottery collected in Veneto and Friuli Venezia Giulia (see below, chapter 4.2, pp. 80-96).
[25] S. Santoro Bianchi explained the attention for Tyrrhenian products with the presence in these territories of both scholars and laboratories trained in the detailed examination of ceramic fabric required by this kind of studies (SANTORO BIANCHI 1990, p. 379).
[26] OLCESE 1993.
[27] See above, p. 70.
[28] OLCESE 1993, p. 59.

It has to be noticed that Olcese adopted already in the title the definition *ceramiche comuni*, following what had been suggested years before by Mannoni[29]: the plural name allowed the author to consider simultaneously several productions, characterised by different technological properties and used for a variety of purposes.
This work has to be really considered a turning point in coarse ware studies, since it clearly and widely shaped the high informative potential of this kind of pottery. It made evident that, in order to retrieve from coarse ware as much *data* as possible, it is necessary to study it with a multidisciplinary and comprehensive approach, taking into consideration not only morphology but also fabric features and technological characteristics. Furthermore, it stressed the essential value of the archaeological context of discovery, that could shed light on differences between production and consumption centres and on modes of circulation of different shapes and prototypes.
Furthermore, after this comprehensive application of archaeometric techniques to coarse and common ware, the scientific community opened a debate about possible future developments of this kind of research.
As a result, various conferences, workshops, and more informal meetings, focusing on common and coarse ware studies, have been organised throughout Italy. Just to recall two of the most fruitful experiences, the conference organised in 1994 in Naples by the *Centre Jean Bérard*, significantly entitled *Les céramiques communes de Campanie et de Narbonnaise*[30] and the *Giornata di archeometria della ceramica*, organised by Sara Santoro in Bologna in 1997[31]. This first edition was devoted to the relationship between morphology, vessels function and technological features of ceramic body, perfectly echoing the main issues pursed by pottery studies. The conference became a yearly appointment until 2010 and produced fourteen editions and proceeding publications.

[29] Cfr. above, p. 73.
[30] The proceedings have been published in 1996, edited by M. Bats (see *Les céramiques communes* 1996).
[31] The proceedings have been published in the same year, edited by S. Santoro Bianchi e B. Fabbri (see *Analisi Archeometriche 1997*).

These initiatives illustrate to what extent, in the nineteen nineties, common and coarse ware found their space in archaeological research, addressing many issues and fostering future developments.
From this moment on, coarse ware was always included in archaeological reports and publications and it was used to infer a plethora of information about different aspects of everyday life in ancient communities. The steadily growing number of papers, books, conference proceedings is now difficult to list and summarize.
However, it would be impossible to conclude this not exhaustive survey, without mentioning another initiative, started in 2002 and still on-going: the conference, organised as a triennial event, *Late Roman Coarse Ware, Cooking ware and Amphorae in the Mediterranean*, now at its seventh edition[32]. The relevance of these conferences, taking aside the great emphasis given to archaeometric analysis, nowadays widely accepted and recognised as an important, if not essential, part of a comprehensive ceramic studies, lies in the fact that the scientific committee aim to tackle the transitional period between the end of the Roman Empire and the beginning of the Middle Age, so long neglected by the majority of researchers.
Moreover, scholars dealing with pottery collected in sites all around the Mediterranean basin are invited to join the debate, in order to construct the most comprehensive and complete picture of presence of this kind of pottery, and to control similar historical paths of production and circulation within different regions of the ancient Mediterranean world, from the West to the East.
Initiatives like this, and their long-lasting vitality, testify the fast development of coarse ware studies that, in a few decades, moved from being completely neglected, to carving out a growing space within archaeological research; raising always new questions and opening new issues, they also highlight once more that research is far from its conclusion, and that still many problems need to be faced.

[32] The first conference was organised in Barcelona in 2002. The conference was then hosted in Aix-en-Provence in 2005, between Pisa and Parma in 2008, in Thessaloniki in 2011, in Alexandria in 2014; the last one was in Agrigento in 2017 and the forthcoming will be hosted in Valencia in October 2019.

4.2 Coarse ware studies in *Friuli Venezia Giulia*: an overview

Generally speaking, coarse ware vessels never reached the high level of standardization of other pottery productions, such as amphorae and *terra sigillata*, just to mention two mass produced Roman pottery products with common features spread all over the territories of the Roman Empire.
This is the reason why, in looking for comparison for the materials analysed in the present work, greatest attention has been paid to studies on coarse ware found in *Regio X*, and above all in the territory once under the influence of the Roman colony of Aquileia, capital of *Venetia and Histria* from the Augustan era[33]. Thus, as the title of the present paragraph suggests, a brief overview of the regional state of the art is deemed necessary.
The list provided is far from being exhaustive; indeed coarse ware studies in nowadays Friuli Venezia Giulia still suffer from the lack of a shared methodology and publications are extremely heterogeneous. Furthermore, sometimes it really turns out difficult to trace all the works concerning these materials, since they are scattered in different publications, ranging from single papers, frequently in journal with limited local circulation, to brief articles in more comprehensive studies.
Studies on coarse ware, after an initial focus on South and Central Italian materials, started attracting attention also in Northern Italy and they have been precociously accepted and chased by scholars facing pottery from archaeological sites located in nowadays Friuli Venezia Giulia.
Studies on coarse ware from these territories adopted, at the beginning, mainly a morphological approach; following the more general scheme, in the first typologies coarse ware was considered within the broader

[33] The reasons behind this choice and a more detailed definition of the area taken into consideration for the searching of comparison are going to be explained in detail in the next chapter (See chapter 5.2, pp. 129-136).

group of common ware. Furthermore, regional studies were divided in two branches, keeping Roman and Medieval coarse ware separated, thus preventing the possibility to appreciate the evolution of these productions through time.
However, while in Central and Southern Italy, studies on coarse ware gave priority to Roman and Late-Antique ceramics[34], in Friuli Venezia Giulia greater attention has been paid to Medieval pottery.
After the great earthquake in 1976, that heavily damage the tower bells of the *Basilica* in Aquileia, some restoration works brought to light several archaeological layers, whose material were published by Luisa Bertacchi in *Ceramiche dal XIV al XIX secolo dagli scavi archeologici di Aquileia*. The publication devoted an autonomous space to coarse ware, but its importance lays also in the precise chronology established on the basis of a well-defined stratigraphic deposit, investigated with the most modern methodology available at the time[35].
For the Roman period, one of the first attempts to organise coarse ware materials in a systematic typology is in the paper *Scavo di una villa rustica a Joannis (Udine)* edited by M.J. Strazzulla Rusconi in 1979 and published in the local journal *Aquileia Nostra*[36]. The author, although considering them as a subgroup of common ware, analysed also the whole assemblage of coarse ware, labelled as *recipienti da fuoco e in rozza terracotta scura*.
Shapes are divided in plates, *ollae* and lids; within this broader, functional groups, different types were isolated, on the basis of differences in rim morphology. Thus the classification proposed is mainly a morphological one; however the author made interesting remarks about fabrics, observed only through macroscopic inspection.

[34] As widely demonstrated above, the birth of coarse ware studies in Italy could be considered the publication of Ventimiglia - *Albintimilium* excavations, whose material are dated between the 2nd century BC and 7th century AD.
[35] BERTACCHI 1977. However important this work is, it has to be noticed that coarse ware materials are presented only through pictures, while no other graphic documentation is provided, making quite difficult to identify ceramic morphology and to find comparisons with other materials.
[36] STRAZZULLA RUSCONI 1979. The contribution was conceived as a first report of the excavations of a Roman *villa rustica* identified about 15 kms from Aquileia. It contains a brief overview of the site and the structures recovered and a wide part is devoted to the catalogue of all the materials collected, divided in different classes.

The low number of materials studied resulted in a limited typology[37]; nevertheless this is still considered a benchmark in coarse ware studies within the Aquileia territory. Indeed, the clear graphic *apparatus* comprehends drawings of all the pieces; dating relies on both stratigraphic information and comparisons with other coarse wares; the author proposed for the majority of the vases a chronology, in most cases still widely accepted.

Mirroring the nationwide framework, the nineteen eighties witnessed a growing interest in coarse ware studies. Increasing contributions provided to archaeological research by hard sciences helped to go beyond a merely morphological approach, reaching a more comprehensive knowledge about pottery fabric and thus opening new insight on ceramic production and circulation.

The traditional lack of knowledge about coarse ware from the early Middle Age diminished thanks to the publication of the *castrum* Invillino - *Ibligo*, edited by V. Bierbrauer in 1987[38]. The author studied the complete assemblage of coarse ware materials collected on site (about 27.000 fragments), referring to them with the German definition *Hauskeramik*. He adopted a morphological *criterion*, dividing the vases in the two groups of open and closed form. Within these classes, materials were then split in bowls and basins on the one side, and *ollae*, beakers and other closed forms on the other. Within each group he defined different types, according to some morphologic features, above all the peculiar shape of the rim. Crossing this typology with the

[37] Indeed the classification proposed comprehends only two types of plates, five types of *ollae* (some of them with inner variants) and five types of lids (STRAZZULLA RUSCONI 1979, cc. 63-73).

[38] BIERBRAUER 1987. The proposed typology has been then presented by Bierbrauer during a series of seminars devoted to late antique/early Medieval archaeological problems held in Menaggio and Como between 1988 and 1989. The publication of the proceedings in Italian facilitated the spread of Bierbrauer's classification, that still constitutes the most followed one. Its acceptance was fostered by the fact that materials from Invillino were not unknown by scholars before Bierbrauer monograph; indeed some preliminary reports had been published long before (just to mention one contribute, essential is the report of the 1962,1963 and 1965 excavations edited by G. Fingerlin, G. Garbsch and J. Werner in the 1968 edition of *Aquileia Nostra*. Coarse ware was widely presented already in this paper, equipped with a clear and comprehensive graphic *apparatus*. See FINGERLIN, GARBSCH, WERNER 1968).

information provided by stratigraphy, he was able to infer the evolution of these productions and to assess a chronology for each type, supported by comparisons with published materials collected from stratigraphically excavated sites in Austria and Slovenia. Bierbrauer's typology dispensed of fabric features; his few remarks about technological characteristics did not aim at the identification of different production phases. However, despite this and some other limitations, Bierbrauer's work became immediately a benchmark for ceramic studies in Friuli Venezia Giulia (and in North - Eastern Italy) and the chronology he proposed is still widely accepted.

Only one year later, the knowledge about regional coarse ware was implemented by a short paper on the excavations of two *villae rusticae*, unearthed in Vidulis and Coseano, two small towns within the former Aquileia's territory[39]. Both *villae* were founded in the 1st century AD and remained in use until the 3rd century AD; then they both knew a second phase, dated between the 4th and the 5th century AD, when they were both abandoned[40].

Coarse ware collected here thus immediately precedes Invillino - *Ibligo* and together both publications provide a comprehensive overview on the evolution of this class over several centuries. The particular interest of this publication lies in its focus on common wares, whose informative potential, mainly as a dating tool, is clearly stated by the author[41].

Although coarse ware is still considered a subgroup of common ware[42], the first one is the only one analysed in the paper. The author identifies different shapes (*ollae*, bowls, plates and lids), each one divided in types according to rim morphology. Vessels are precisely described and at

[39] *Aspetti della ceramica comune romana in Friuli; materiali da Vidulis e Coseano*, published by Lidia Rupel in the local journal *Aquileia Nostra* (from this moment on, RUPEL 1988).

[40] The most recent and comprehensive overview about the two *villae rusticae* is contained in DE FRANCESCHINI 1998 (pp. 358-359 for Coseano and pp. 386-387 for Vidulis). Here are also underlined the similarity between the history of the two sites.

[41] See RUPEL 1988, c. 105: "*Lo studio della ceramica comune ha inoltre contribuito a definire meglio le fasi di vita delle due ville e a testimoniare concretamente la continuità abitativa tra le due fasi principali individuate".*

[42] The author indeed identified, within common ware, two classes: *rozza terracotta scura* (coarse ware) and *ceramica comune depurata* (fine common ware).

least one drawing for each type is provided. Comparisons with materials found in North-Eastern Italy, Austria, Slovenia and Istria enabled the author to assess the chronology for almost all the collected fragments, supporting the identification of different occupation phases at the sites.

Another essential publication presented materials collected in another *villa rustica*, identified within the Aquileia's territory. In 1991 Giovanna Cassani devoted an entire paper to coarse wares found during the excavations of a *villa rustica* identified within the modern municipality of Pavia di Udine (UD), once in Aquileia's *ager*[43]. This work turns out to be of particular interest for different reasons; first of all because, for the first time in regional studies, coarse ware is analysed as a group *per se*. Furthermore, the classification is based on functional and morphological *criteria*[44], and enriched with macroscopic fabrics analysis: differences in colour, walls thickness, quality and quantity of inclusions, enabled the identification of seven different fabrics, that however seem connected neither to functional nor to morphological classifications. Finally, materials from the Pavia di Udine *villa rustica* are perfectly dated since they were found in a closed dump, whose stratigraphic position, together with the abundance of long distance traded fine pottery, confirm a chronology to the Augustan - Tiberian Age (beginning of the 1st century AD).

Cassani limited her work to description and presentation of the finds; well aware that a *villa rustica* is a small world not necessarily linked to supra-regional patterns, she did not overpass the local borders in drawing her analysis [45].

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[43] CASSANI 1991. Unfortunately it appeared only as a short paper in a local journal, therefore sold at less than a fair value, lowering the possibilities for this work to be widely known.

[44] Materials are divided firstly according to their functions in *ollae*, pans, jugs, beakers, bowls and lids; then, within each of them, vases are subdivided on the base of rim morphology.

[45] However, at the very beginning of the paper, Cassani accepted the idea that this kind of ware could have been traded beyond regional borders, see CASSANI 1991, p. 89: "*Nei tempi recenti l'interesse per questo vasellame a lungo negletto è andato via via crescendo ed è andato oggetto di accurate indagini scientifiche che hanno accreditato l'ipotesi di una sua possibile commercializzazione e diffusione a livello interregionale e tra le provincie dell'Impero come se si trattasse di una vera e propria produzione seriale*".

If this work testifies the reception, also in Friuli Venezia Giulia, of the most important achievements reached in coarse ware studies, the publication of the excavations led by the University of Trieste in Aquileia, in the area East of the Roman *forum*, edited in the same year, moves in a more traditional framework[46]. Following the same methodology already adopted for Vidulis and Coseano materials, Lidia Rupel, in charge of the coarse ware publication, still considered these materials as a subgroup of common ware[47]. Despite some remarks on the fabrics, artefacts follow a functional distinction that separates *ollae,* bowls and *dolia*; within each of these groups, morphological types are identified mainly following variations in rim features. Comparisons with finds from other sites within the former *Regio X*, comprehending also nowadays Veneto, Slovenia and the former *Noricum*, today's southern part of Austria, allowed to establish a chronology, supported by stratigraphic *data*, and still considered reliable.

The focus is set on practical destination. Coarse ware is therefore considered to derive from the local proto-historic tradition, mostly locally produced, and intended for limited diffusion only [48].

Contributes so far discussed dealt mostly with Roman - Late Antique materials but also research on Medieval coarse ware evolved in that period.

An overview of the studies available at that time is contained in the essay *La ceramica grezza medievale in Friuli Venezia Giulia* published by A. Negri in 1994[49]. After the review of the bibliography, the author

[46] The results of the excavations have been published, edited by M. Verzár-Bas, in a first, comprehensive volume *Scavi ad Aquileia. Volume I: l'area a Est del Foro. Rapporto degli scavi (1988)* (from this moment on simply *Scavi ad Aquileia 1991).*

[47] See RUPEL 1991, p. 145: "*Tra il materiale dello scavo di Aquileia si sono potuti distinguere due gruppi di ceramica comune: 1. ceramica grezza d'impasto o rozza terracotta scura (CCg); 2. Ceramica comune depurata o semidepurata (CCd)".*

[48] See RUPEL 1991, p. 147: "*I confronti con le zone più lontane sono meno attendibili per le caratteristiche di questa ceramica che è di origine protostorica e di produzione locale. La diffusione era limitata, perché essa rispondeva a criteri di funzionalità e basso costo di produzione e non risentiva in modo rilevante dei cambiamenti della moda*".

[49] The paper (from this moment simply NEGRI 1994) is part of a comprehensive book, containing several essays written by different scholars all concerning the materials most commonly found on both urban and rural settlements of Northern Italy, and dated between Late Antique and Medieval periods. The aim of this publication, with the telling

presents coarse ware found in late Medieval layers excavated in San Daniele del Friuli, outlining its evolution after 11th century. The presentation of these materials allowed Negri to tackle a still unresolved feature of coarse ware vases in Friuli Venezia Giulia, i.e. the presence of some relief stamps on the bottom of the vessel, all different from one another. It is a specific phenomenon of *Regio X*, attested both in the 1st century AD and later, in the Medieval period; the function of these stamps is still to be determined, also because the study is still at the very beginning[50].

The knowledge on coarse ware produced and used between 4th and 7th century AD has been deepened by the study of materials unearthed during the excavations in Udine, on the hill of the castle, in 1986-87 and in 1989, published by M. Buora and M. Fasano[51]. They adopted Bierbrauer's typology, accepting his chronology, further confirmed by both stratigraphic *data* and a comparative study with several sites in the region[52].

The growing number of publications testify to what extent coarse ware studies had gained attention among local scholars; the increased

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title *Ad Mensam. Manufatti d'uso da contesti archeologici fra tarda Antichità e Medioevo*, was to provide young students with a tool that contains an overview of the archaeological findings and a picture of the current bibliography.

[50] In this paper Negri provides a preliminary classification of stamps belonging to medieval coarse ware *ollae;* this first classification has been later implemented in LUSUARDI SIENA, NEGRI, VILLA 2007 that also contains an update of the bibliography on the topic.

Relief stamps on the bottom of coarse ware *ollae* characterised also materials dated between 1st century BC and 1st century AD. A more detailed discussion about this peculiar feature is also provided in chapter 6.8 *Bases* of the present work (see pp. 366-370). It is worthy to mention here DONAT 2016, the most recent work that summarizes all the evidences and that provides a general overview of this earlier appearance of the *phenomenon*.

[51] The authors present 178 coarse ware fragments, belonging mainly to *ollae* and pans, in a paper dedicated to pottery that testify Udine's long history, from proto-historic times to modern days. (see BUORA, FASANO 1994, especially pp. 179-181).

[52] The sites taken into consideration were: the Langobard necropolis in San Romans d'Isonzo (GO), the church of San Giorgio di Nogaro (UD), a residential area near the ancient Roman *forum* in Aquileia, the Late Antique castle of Vrh Brsta near Logatec, in Slovenia. BUORA, FASANO 1994, p. 181.

knowledge led to some important results in this study branch, affected in the nineteen nineties by some radical changes.
A first evidence could be traced in the second publication of Aquileia excavations, edited in 1994. Coarse ware was studied again by Lidia Rupel, who, in this occasion, widely accepted some innovations, making her analysis of the materials collected during the 1989-90 fieldwork activities particularly important.
She decided to consider coarse ware as a class *per se* and not anymore as a subgroup of common ware, as in the previous publication in 1991[53].
Furthermore, withdrawing the old definition of *rozza terracotta scura*, the author used here the new label of *ceramica grezza*, recognising that, far from being simply rough and behind its manufacturing techniques, it usually implies a high level of technology and potters skill.
A brief, general, description of both pottery fabric and most common decorations is provided in the introduction to the catalogue, however without moving to further considerations; materials are then presented in a quite traditional way, grouping them in broad functional categories (*ollae*, pots, pans, bowls and lids), and then isolating, within each of them, some morphological types, mainly defined by rim shapes.
The search for comparisons in a broad area, comprehending both Central and Northern Italy, led the author to hypothesize the trade of coarse ware even over long distances. However, in the end she did not formulate any final comment, looking forward to new coarse ware archaeometric analysis in order to solve this question[54].

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[53] Rupel has been mainly influenced, as she admitted, by research led by S. Santoro Bianchi and her team on coarse ware found in Castelraimondo. Rupel widely explain her decision to overcome the so far usual coupling of coarse and common ware: see RUPEL 1994, p. 195: "*Negli ultimi anni sono notevolmente aumentati gli studi sulla ceramica grezza, tanto che S. Santoro Bianchi giustamente si chiede, se non sia ormai riduttivo ritenere la produzione d'impasto quale sottoclasse della ceramica comune. Il dubbio è assai fondato. Le due classi ceramiche hanno sicuramente in comune la destinazione d'uso; presentano però numerose differenze: l'impasto, il colore della superficie, la tecnica di lavorazione, le origini delle forme più peculiari e della decorazione, la loro diffusione. Sarebbe quindi più opportuno ritenere la ceramica grezza una classe a sé stante con caratteristiche proprie*".

[54] The author is perfectly aware that coarse ware raises some problems about its production and circulation. Moving beyond the traditional idea that it was mainly locally produced, based on its claimed low quality, she suggested instead the possibility that at

In this context, of particular interest is the coarse ware unearthed at the complex site of Castelraimondo di Fogaria (UD) by the University of Bologna, published in a two-volume monograph in 1995[55].
Since coarse ware turned out to be the most commonly found pottery on this site, otherwise poor of other mobile archaeological evidences, scholars decided to analyse this class in a way as articulated as possible, in order to retrieve maximum information. The morphological catalogue[56], flanked by a detailed description of decorations[57], was completed by a comprehensive characterization of ceramic fabric. Indeed, coarse ware fabric has been analysed through macroscopic observation, using elements such as surface colours, presence of any

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least some products could have been traded, either for their higher technological features or as food containers. However, she also suggested that the existence of the same shapes in different places could be explained as a result either of the work of some travelling potters or the circulation of some 'fashionable' prototypes.
Finally, after having listed all these different possibilities, Rupel did not consider any of them trustable in its whole, leaving the question open to further analysis. See RUPEL 1994, pp. 195-196: "*Tra i problemi che la ceramica grezza pone c'è certamente quello riguardante la sua produzione e conseguente commercializzazione. Si ritiene fosse prodotta in loco e da maestranze non specializzate […]Questa soluzione non sembra adattarsi bene però ai prodotti di fattura migliore[…]si chiede inoltre quanto ampia fosse questa diffusione, se limitata soltanto all'ambito regionale o anche a zone più lontane, dando quindi vita a una vera e propria commercializzazione di questo vasellame. La presenza di confronti in aree anche lontane farebbe pensare alla possibilità di un commercio di tali prodotti[…] Rimane però il fatto della scarsa resistenza di questo vasellame agli urti, che lo rendeva poco adatto al trasporto.*[…] *Per altri (autori) invece le analogie sono da ascrivere alla presenza di artigiani itineranti o alla circolazione di 'modelli' che influenzarono la produzione. Soltanto in futuro sarà possibile rispondere a questo quesito con l'approfondimento degli studi su questo particolare gruppo ceramico e con l'apporto indispensabile ormai delle analisi archeometriche che potranno definire meglio il problema di una possibile commercializzazione di questo tipo di vasellame".*

[55] The results of the excavations have been published in two volumes; the first one, devoted to the site, contains detailed descriptions of stratigraphic deposits and of the structures recognised (*Castelraimondo I*), and the second one concerns the finds and the use of IT and archaeometric technologies to study them (*Castelraimondo II*).

[56] Flanked by a detailed graphic *apparatus* (see COVIZZI 1995).

[57] Decorations have been studied taking into consideration both technological aspects (instruments and techniques used, position of decorations on the vases and way to realize them) and motives adopted. This leads to a catalogue of different kinds of decorations, that has been then completed by an analysis of the reasons behind every kind of motif identified, using also some categories borrowed from ethnographic researches (for descriptions and results, see MARTELLI 1995).

kind of *engobe* or slip, nature and dimension of inclusions, reaction of ceramic paste to firing, use and post-depositional factors as distinctive *criteria* for productive techniques. In this way four fabric groups have been identified, each of them with some variants; in some cases the relationship between a peculiar form/dimension with a particular fabric suggests that some fabric features were purposely selected on the base of the vessel function(s)[58]. Some selected samples have been then processed through archaeometric analysis (polarized light microscopic observations and X-Ray Diffraction Analysis) in order to verify the fabric classification provided by macroscopic analysis, to clearly identify the processes of pottery production and to possibly define the provenance of both raw materials and vessels. The results confirmed that coarse ware materials from *Castelraimondo* are characterised by a quite homogeneous compositions; still some differences in the way in which raw materials have been treated and mixed together seem to have changed through time, supporting the different chronology assessed for the vessels[59].

The results provided by these different analysis have been managed through a made-on-purpose software, in a pioneering application of IT technologies to ceramic studies[60]; the possibility to have a general view on all the information available allowed to exploit at its best coarse ware's informative potential. Castelraimondo materials provided important *data* with regard to production techniques and circulation of these vases, improving the knowledge about the relationship existing between little settlements on the mountains and bigger urban centres in the flatlands[61]. Castelraimondo publication was a real turning point in coarse ware studies, with substantial impact on both the number and quality of contributions.

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[58] See MANFREDI 1995.

[59] For a detailed description and results of archaeometric analysis, see FAILLA 1995.

[60] The software, named *Aladino*, had already been presented by Maria Pia Guermandi some years before, during the annual conference held in Aquileia by the *Centro di Antichità AltoAdriatiche* (see GUERMANDI 1990).

[61] Results of Castelraimondo coarse ware studies have been widely explained by Sara Santoro some years later after this first publication (see SANTORO BIANCHI 1998, in particular pp. 266-268).

Most recent studies tend to be more and more specialised, focusing the attention on peculiar productions, sometimes even on one single shape. To mention only a couple of examples, the study presented by M. Buora e G. Cassani at the *Primo Incontro di studio sulle ceramiche tardo antiche e alto medievali* is dedicated entirely to a peculiar form, the *terrine*[62], found on different sites all around the nowadays Friuli Venezia Giulia, with particular attention to vases unearthed in graves and necropolis, that provide a more trustable chronology. The aim of the authors was to create, a single-shape late antique typology suitable for all the region[63].

Another particular production attracting a growing attention by scholars is the *Auerberg* ceramic, a peculiar kind of coarse ware, made in series, and including shapes ranging from beakers to big *ollae*.

The name comes from the Roman settlement on the Auerberg hill, in nowadays Germany, that was firstly hypothesized as production place, given the high number of this kind of pottery recovered here[64].

Recent research[65] demonstrate that, aside Austria where they constitute the most common 1st century BC coarse ware shape, Auerberg pots reached, mainly in the 1st century AD, a wide distribution in all the

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[62] The authors, acknowledging the lack of a shared terminology, listed the other names currently in use by the published bibliography for this shape (*ciotole, catini, scodelle* in Italian, while Bierbrauer used *Schalen* if the ratio diameter/height is less than 1/3, *Schüssel* in the other cases). They then defined that for them *terrine* stand for medium vases (with a rim diameter between 13 and 24 centimeters), with a rounded body and curved walls. See BUORA, CASSANI 2002, p. 56*: "Nel nostro caso intendiamo prendere in esame i recipienti di non grandi dimensioni(con diametro alla bocca compreso tra 13 e 24 cm) che abbiano la parete curva e quindi non presentino la parete esclusivamente oblique propria dei catini)".*

[63] See BUORA, CASSANI 2002, p. 55: "*Sembra nondimeno opportuno tentare di fare il punto sulla situazione di questi oggetti, nell'ambito della ceramica grezza, alla luce delle conoscenze attuali".*

[64] This production has indeed been defined for the first time in the publication of *Auerberg* excavations. See FLÜGEL 1999, pp. 77-107.

[65] *Auerberg* pots attracted the attention of Italian, Austrian, Slovenian and Croatian scholars; thus the list below should be considered only as a first and essential overview of the principal work on *Auerberg* production.

For *Auerberg* pots from *Retia*: FLÜGEL, JOACHIMSKI, FLÜGEL,1997; from *Noricum*: SCHINDLER KAUDELKA, ZABEHLICKY-SCHEFFENEGGER 2007; for the *Regio X*: DONAT 2001; DONAT, FLÜGEL, PETRUCCI 2006; DONAT, MAGGI *et Alii* 2007. For a general overview, with the contribution of archaeometric analysis: FLÜGEL, SCHNEIDER 2001; FLÜGEL *et Alii* 2004.

Regio X but also in Slovenia and Croatia, thus testifying how popular their content had become. Locally made pots started to be produced in several workshops spread all around the above-mentioned territories. Recent research have finally defined the main use of some productions as containers for preserved meet, and have detected and reconstructed the path followed by both the contents and the containers[66].

The outlined overview is enough to underline the increasing interest resulting either in single papers or sections within wider monographs dealing with coarse wares; furthermore several synoptic works have been published, in order to summarize the actual knowledge and to gather materials known only through a number of short papers, that did not provide the general view essential to infer broader knowledge about processes that involved a wide territory.

Several recent publications review the bibliography, updating the existing knowledge, and providing a more general view that expands the possibility to make connections between different phenomena.

A first contribute in this direction is summarised in the paper *La ceramica nella Cisalpina Orientale dalla fondazione di Aquileia ad Augusto* by Patrizia Donat[67]. Here the author browses the published bibliography about ceramic finds in several sites within the nowadays Friuli Venezia Giulia, dated between the 1st century BC and the 1st century AD. The broad geographic analysis enables the creation of distribution charts of different pottery types, allowing the study of pottery distribution within the above-mentioned geo-chronological borders. This approach has been further developed by the same author in her PhD thesis in 2010. In her work Donat analysed the distribution of several pottery productions within the nowadays territory of Friuli Venezia Giulia, in contexts dated from the foundation of the Roman colony of Aquileia (181 BC) to the end of the Augustan era[68].

In this sense, an important experience aiming at enhancing the comprehension of coarse ware production and circulation dynamics

[66] For a in-depth dissertation about this kind of pottery and its distribution, see the section devoted to the unique fragment of *Auerberg olla* recognised within the materials collected on *Stella 1* site provided in chapter 6.1.9, pp. 289-304.

[67] DONAT 2009.

[68] DONAT 2010.

could be traced in the series of publication entitled *Presenze Romane nel territorio del Medio Friuli*. The series comprehends thirteen volumes, each one devoted to a town (and the relative territory) in Friuli Venezia Giulia, whose main archaeological finds are widely presented, with a detailed graphic documentation[69].

These examples are the most exhaustive works adopting a comprehensive approach, either for the in-depth and multidisciplinary analysis (Donat's publications) or for the number of sites investigated (*Presenze Romane*'s series). However, as it is going to be further explained in the last paragraph of the present chapter, this wider and general view on coarse ware is still quite rare in regional studies.

The steadily growing number of work dealing with coarse ware makes it impossible to give a detailed description of each contribute published in the last fifty years, therefore the main contributions have been summarised in the table below. It collects the most important studies, the context of discovery and its chronology. For an easier use, the methodology adopted for the research and the main reference have been added.

Browsing the table, arranged in chronological ascending order of the references, it will be evident to what extent the methodology adopted is still a traditional one. Indeed the creation of chrono-typological classification, based mainly on pottery morphology, is still considered the only safe ground to tread on. The inclusion of archaeometric studies remains quite rare in research on regional coarse ware.

Site	**Context**	**Chronology**	**Methodology for CW studies**	**Bibliography**
Medea (UD)	Settlement	1st - 2nd cent. AD	Morphol. Study	FURLANI 1971
San Daniele (UD)	Necropolis	1st cent. BC - 1st cent. AD	Morphol. Study	ZUCCOLO 1983
Udine	Necropolis	1st cent. AD	Morphol. Study	BUORA 1984

[69] All these books have been widely consulted for the present work; however, in order to be more concise, in the table below only the main and the most important ones have been mentioned. References to other works can be found in the bibliographical references.

Sevegliano (UD)	Settlement	1st cent. BC - 4th cent. AD	Morphol. Study	ZUCCOLO 1985
Pradamano (UD)	Necropolis	Late Antique - Early Medieval	Morphol. Study	BUORA 1988
Romans d'Isonzo	Necropolis	Late Antique - Early Medieval	Morphol. Study	GIOVANNINI 1989
Castions di Strada (UD), Rem del Sterp	Settlement	1st cent. BC - 1st cent. AD	Morphol. Study	CASSANI, TERMINI 1991
Aquileia, *Forum* (UD)	Public Building	2nd cent. BC - 4th cent. AD	Morphol. Study	CASSANI 1994, pp. 74-79
Iutizzo (Codroipo, UD)	Necropolis	4th cent. AD	Morphol. Study	BUORA 1996, pp. 56-59
Codroipo (UD)	Various Sites	2nd cent. BC - Late Antique	Morphol. Study	CIVIDINI 1996
Sedegliano (UD), Loc. Turrida, *Villa rustica*	*Villa Rustica*	End of the 1st cent. BC - 3rd/4th cent. AD	Morphol. Study	CIVIDINI 1997, pp. 45-74
Sevegliano (UD)	Well	2nd cent. BC - 5th cent. AD	Morphol. and Archeometric Study	CASSANI, FAILLA SANTORO 1997, pp. 95-101
Aquileia (UD), various sites	Settlement	Various	Morphol. and Archeometric Study	FAILLA, MASELLI SCOTTI, SANTORO 1997
San Martino a Rive d'Arcano (UD)	Ecclesiasti-cal building then used for domestic purposes	Early Medieval	Morphol. Study	NEGRI 1997

Montereale Valcellina (PN), Zuglio (UD), Paularo (UD)	Settlements	1st cent. BC - 1st cent. AD	Morphol. Study	VITRI, DONAT 1997
Muggia Vecchia - *Castrum Muglae* (TS)	Settlement	Late Antique-Early Medieval	Morphol. and Archeometric Study	RIAVEZ 1998, RICCOBONO 2004
Codroipo (UD), Piazza Marconi	Public Building	1st cent. BC - 1st cent. AD	Morphol. Study	BUORA, CASSANI 1999
Galleriano (UD), Loc. *Las rives*	*Castelliere*	1st cent. BC - 4th cent. AD	Morphol. Study	CIVIDINI 2000, pp. 72-80
Zuglio	Settlement	1st cent. BC - Late Antique	Morphol. Study	DONAT 2001
Flambruzzo (UD), Loc. *Il Bosco*	*Villa*	1st cent. BC - 1st cent. AD	Morphol. Study	MAGGI 2001. pp. 109-152 CIVIDINI, DONAT *et Alii* 2006, pp. 29-31.
Rivignano (UD), Loc. *Codis*	*Villa Rustica*	1st cent. BC - 1st cent. AD	Morphol. Study	MAGGI 2001, pp. 197-199
Castions di Strada (UD) - Loc. *Le Selve*	Domestic building (Farm?)	1st cent. BC - 1st cent. AD	Morphol. Study	CIVIDINI 2002, pp. 95-103
Castions di Strada(UD), Loc. *Paradiso-Rem del Sterp*	*Villa Rustica*	1st cent. BC - 1st cent. AD	Morphol. Study	CIVIDINI 2002, pp. 187-193
Attimis (UD)	Castle	13rd - 14th cent.	Morphol. Study and Microscopic Analysis of ceramic fabric	CASSANI 2003

San Vito (PN), Loc. *Gorgaz*, Chions (PN), *Loc. Gheno*, Morsano al Tagliamento (PN), Loc. I Pars	*Villa Rustica;* unknow settlement; *villa rustica*	1st cent. BC - 1st cent. AD	Morphol. Study	VENTURA, DONAT 2003
Trieste, Loc. *Crosada*	Settlement	From 1st cent. BC to Late Antique	Morphol. Study and Microscopic Analysis of ceramic fabric	RICCOBONO 2007
Trieste, Loc. *Crosada*	Settlement	Medieval ad Reinassance	Morphol. Study and Microscopic Analysis of ceramic fabric	BORZACCONI 2007
Osoppo (UD), S. Pietro church	Church then used for domestic purposes	6th/7th cent. AD	Morphol. Study	LUSURADI SIENA, NEGRI, VILLA 2007
S. Daniele del Friuli (UD)	Settlement	End of 6th cent. AD - half of 7th cent. AD	Morphol. Study	LUSURADI SIENA, NEGRI, VILLA 2007
Sevegliano (UD)	Settlement	3rd cent. BC - 8th cent. AD	Morphol. Study and Microscopic Analysis of ceramic fabric	CASSANI 2008a
Aquileia (UD), Grandi terme	Public building then used for domestic purposes	5th - 7th cent. AD	Morphol. Study	BORCHIA 2008
Castelrai-mondo (UD)	Settlement	Late Antique - Early Medieval	Morphol. and Archeometric Study	CIVIDINI 2010

Aquileia (UD)	Urban *domus*	3rd cent. AD - 11th cent. AD	Morphol. Study	CEAZZI, DEL BRUSCO 2014
Teor (UD), Loc. *Casali Pedrina*	Workshop then used for domestic purposes	1st cent. BC - 4th cent. AD	Morphol. Study	CIVIDINI, MAGGI 2014
Aquileia (UD), Loc. *Santo Stefano*	Necropolis	1st cent. BC - 1st cent. AD	Morphol. Study	VENTURA 2015
Locavaz, Loc. *Moschenizze*, 'Palazzo d'Attila' and 'Casa Pahor'	Settlement and workshops	1st cent. BC - Late Antique	Morphol. Study	VENTURA, DEGRASSI 2016

4.3 Current results: coarse ware production, use and trade

In quite recent years, acknowledging that coarse ware represents the highest percentage of ceramic materials collected in the majority of the excavations[70], led to a wide recognition of its informative potential, thus determining the fast development of this field of study.
Compared to sixty years ago, current knowledge about the topic has been widely increased, improving the variety of information that can be retrieved from this kind of pottery.
Browsing the bibliography, it is evident that fabric characterization constitutes now a basic argument in coarse ware studies. A first, important result of fabric analysis has been the confirmation of the high technological level often hidden behind coarse ware rough appearance. Coarse ware has been underestimated for long and considered as a low-technology production: pots were mainly thought to be handmade, formed without any skilled intervention on raw materials and fired in open bonfires. These features made scholars firmly believe that coarse

[70] A first recognition in OLCESE 1993, p. 46.

ware was mainly locally produced on household level, by non-specialized workers, with the aid of very simple instruments[71].
Further developments of the research on ceramic fabric disclosed that coarse ware peculiar features were purposely realized in order to stabilize the resistance to thermal stresses deriving from their daily use as cooking pots and to decrease fuel consumption, as each and every log of wood had to be brought from outside the settlements and stored near the cooking facility.
As the first fabric characterization by G. Olcese and M. Picon pinpointed, there are at least two possible ways to produce pots able to resist to thermal shocks: either to fire vessels at low temperatures, thus avoiding an extreme rigidity of the ceramic body; or to shape vases with rough clay, featured by inclusions either already present in the raw material or added on purposes. These inclusions create discontinuities in the ceramic body and allow it to bear thermal expansions derived from the alternation of heating and cooling during pot life. Potters needed to balance these two expedients because lowering too much the firing temperature would result in a fragile pot, unfit to resist mechanical stresses; on the other side, adding too much temper would have produced brittle, frangible objects. A good quality cooking pots can be made only balancing accurately the amount and the nature of inclusions with the firing temperature. This turns out to be a difficult task, that requires specialized knowledge and workmen[72].

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[71] This was the current opinion on coarse ware till very recent time. Just to mention only one example, coarse ware materials are still described in this term in the study on findings from the *Grandi Terme* in Aquileia in 2008. See BORCHIA 2008, p. 19: "*Gli autori sono concordi nel definire che la modellazione delle forme in ceramica grezza avveniva a mano, tramite la realizzazione delle varie parti del corpo ceramico in sedi distinte e separate e poi unite insieme; i fondi piatti venivano plasmati tramite semplice spianamento, mentre le pareti erano sagomate a mano o con la tecnica del colombino. Il risultato di questo tipo di lavorazione donava al manufatto un aspetto alquanto grossolano con pareti asimmetriche e spessore irregolare, indizi che accreditano ulteriormente l'ipotesi di una fabbricazione domestica e con strumenti primitivi delle forme in ceramica grezza. Il tutto era poi sigillato dalla lavorazione al tornio lento, probabilmente da identificarsi con un disco fatto ruotare a mano su di un supporto o su di un perno*".

[72] Questions about the technology beyond coarse ware production have been tackled through archaeometric analysis by G. Olcese and M. Picon in the nineteen nineties. First results of their studies were presented during the conference *Ceramica Romana e Archeometria: lo stato degli studi*, organised by the University of Siena at the Montegufoni castle in April 1993. The information provided in the text are taken from Olcese and

Not every potter, nor every workshop,mastered these skills; therefore pottery workshops with high technological knowledge located in the vicinity of quality raw clay and temper were soon engaged in long distance trade[73]. The quality of these artefacts paid off the transport costs[74], as it did for Eastern and African cooking wares traded all over the Mediterranean in late Imperial period. Detailed analysis of coarse ware fabrics, completed by archaeometric studies, unveiled the potential offered by coarse ware in shading light on both ancient production technology and trade dynamics.

Furthermore, since coarse ware vases could also be used as containers for shipping foods[75], their comprehensive study provided useful information about circulation and distribution of perishable contents, otherwise not preserved by the archaeological record.

In Friuli Venezia Giulia, research on the *Castelraimondo* coarse ware, focused on technological aspects, presents a pioneering example on how to extract information about a variety of social, technologic and commercial dynamics.

A combination of macroscopic fabric observation and archaeometric analysis on selected samples confirmed that calcite inclusions were

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Picon's contribute, published in the proceeding of the conference (see OLCESE, PICON 1995, pp. 106-107).

[73] Indeed in some Mediterranean area deposits of clay rich in kaolinite could be found. Having a low coefficient of thermal expansion, these are the perfect raw materials for pottery extremely fire-resistant but also able to resist mechanical shocks (for a more detailed exposition, and an identification of some clay deposits rich in kaolinite, see OLCESE 2003, especially p. 20).

[74] The archaeometric studies by G. Olcese and M. Picon widely illustrated the evident difference in quality between imported and locally produced coarse ware; the authors also provide a reason for the import of this kind of pottery. See OLCESE, PICON 1995, p. 112: "*Le importazioni di ceramiche da fuoco sembrano essere originate sopratutto dalla differente qualità tecnica che esiste tra le ceramiche della zona produttrice e quelle della zona da cui le ceramiche sono state importate. Tale differenza può essere dovuta all'assenza, nei luoghi di importazione, di argille di qualità […]. Un'altra spiegazione possibile è che in talune regioni i vasai abbiano solo parzialmente preso coscienza dei vantaggi della produzione di ceramica da fuoco che unisca in sé le prerogative di una buona resistenza agli chocs termici a quelle di una buona resistenza meccanica. O che non abbiano indagato i modi per realizzare tali ceramiche in area locale o regionale*".

[75] For implications of coarse ware studies on the knowledge of eating and cooking habits, see below, pp. 100-103.

added on purpose to the raw clay to improve resistance to thermal shocks, thus allowing to consider the granular aspect not as a proof of low quality production but rather as an indication of the contrary. From that moment on, it has been recognised as an evidence of the specific technological knowledge of ancient potters who changed from unqualified workforce to specialised craftsmen, able to modify the material at their disposal in order to obtain characteristics that fit with pots functional destination[76].

Archaeometric results provided by *Castelraimondo* coarse ware have been compared with pottery collected on different sites, both urban and rural centres, located within the same area and connected by some of the main roads of the Roman Empire transportation system[77]. The comparison suggested that materials used in upland settlements are more homogenous in shapes and sizes, while pottery from urban centres turned out to be more differentiated. This result has been read as a proof of the convergence in major town of a variety of productions, coming from a wide area. The bigger the settlement, the more diversified the pottery.

Even limited to few samples, this approach use an apparently humble material as coarse ware as a source of useful information for the reconstruction of trade. The picture retrieved was a quite usual one, confirming the nature of urban settlements as redistribution centres while suggesting that economy in rural centres was less complex, with a tendency to autonomy, and bounded to a domestic production of both contents and containers[78].

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[76] Results of archaeometric analysis on Castelraimondo coarse ware are presented, as remembered above, in FAILLA 1995.

[77] Samples have been selected among materials collected at the *villa rustica* of Pavia di Udine, at the settlement at Udine castle, at *castrum* Invillino - *Ibligo*, at the settlement on the hill of Magdalensberg and in the northern necropolis of Ljubljana - *Emona*. This selection enabled the authors to compare materials from complex and stratified central settlements (Magdalensberg, Udine castle), from upland settlements (Invillino, Castelraimondo), and from a *villa rustica* located in a very dynamic economic context. The results are widely explained, also in their socio-economic implication, in SANTORO BIANCHI 1993, pp. 179-180.

[78] See SANTORO BIANCHI 1993, p. 180: "*La conseguenza sul piano della ricostruzione del quadro economico di queste città è che si può pensare che nel centro urbano confluissero prodotti (alimentari) contenuti in ceramiche grezze, provenienti da un bacino ampio; che la migliore qualità*

Studies started in the nineteen eighties emphasized how useful coarse ware can be to retrieve complex information about ancient living practises, in particular about food preparation, consumption and trade.
A pioneering work in using common ware to extract useful information about cooking and eating habits was published in 1988 by M. Bats, in his *Vaisselle et alimentation à Olbia de Provence (v. 350-v. 50 av. J.-C.). Modèles culturels et catégories céramiques*[79].
The author analysed pottery finds unearthed in complex stratigraphic deposits dated from the 4th to the 1st century BC, excavated in a city influenced by different cultures. Born as a Greek colony, Olbia belonged to the *greek koiné* spread on all the Mediterranean shores; however, the peculiar geographic position created a direct link with both the Italic world and the Celtic-Ligurian hinterland. Given the commercial vocation of the city, the inhabitants built a new society, mingling all these three backgrounds, further mixed with some influences from Punic and Iberian cultures[80].
Analysing this complex framework, Bats spotted the effect of a change in cultural influences in the morphological variation of vessel shapes

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delle ceramiche sia riconducibile alla loro funzione di contenitori in una transazione commerciale di prodotti agricoli, e quindi alle necessità connesse di una migliore efficienza conservativa; che esse fossero prodotte in strutture tecnologicamente più evolute, probabilmente in grado di produrre anche altre classi ceramiche. La maggiore omogeneità dei materiali provenienti dai piccoli centri rinvia invece ad una struttura economica di livello estremamente semplice, in cui la produzione del contenitore e del contenuto avveniva probabilmente nel medesimo ambito domestico".

[79] The author examined all the materials collected during the stratigraphic excavations led in the city of Olbia, in nowadays Provence; his first effort is to present the materials in a traditional catalogue, whose categories are the ones at that moment widely accepted within academic world (See BATS 1988, p. 18: "*C'est pourquoi j'ai choisi d'en presente l'inventaire de façon traditionnelle, en suivant les grandes catégories que la recherche archéologique a peu à peu dégagées dans le bassin occidental de la Méditerranée, ce qui aura en outre l'avantage de permettre des comparaisons plus faciles avec d'autres sites archéologiques*"). However it is clear since the beginning that his main aim is to use the information provided by the pottery in order to shed light on eating habits and their transformation through time.

[80] See BATS 1988, p. 17: "*Les habitants d'Olbia se trouvent historiquement et géographiquement au confluent de trios cultures : leur culture d'origine, qui, par leur métropole, les rattache à la koiné grecque, et les deux cultures environnantes les plus proches, le monde italique « romain » et, dans son hinterland, le monde celto-ligure. Par leur activité maritime et commerciale, les Marseillais sont en contact permanent avec ces trois cultures, auxquelles il faudrait ajouter dans une moindre mesure les cultures punique et ibère*".

and in the introduction of new pots; ceramic assemblages dated to the Greek domination are composed of slightly different kind of pots compared to assemblages belonging to Roman times. Indeed, broadly using contemporary written sources, Bats reconstructed, for the former period of Greek influence, a diet based mainly on cereals, legumes and fishes that is represented in four principal cooking pots, i.e., using the Greek names, on one side the *chytra* and the *caccabé* (the second should be considered a kind of variant, shorter and with a larger mouth, of the first one), used for cooking cereals and legumes, boiled or stewed, and, on the other, the *lopas,* used for cooking fishes and the *tagénon*, mainly used for frying[81].

For the Roman period Bats identified different kind of vases: the *olla,* the main shape, used both for fast cooking, placing it directly above the fire, or for slow cooking, just putting the vase nearby the heating source; the *patina* or *patella* (within which two different types are identified), used for cooking stewed and braised meat and fishes, and the *caccabus*, the most versatile pot, that could be used as substitute of both the *olla* and the *patina,* sharing both their functions[82].

The change in cultural predominance led to the introduction of different eating and cooking habits and, as a consequence, of different kinds of pots, that suit the innovation in food preparation and consumption; however, also elements of continuity are explained as cultural *phenomena*[83].

This approach to coarse ware as indicator of eating habits and food preparation and consumption proved to be particularly fruitful when applied to an Italian context, in the study of the material evidences unearthed in a *domus* of Rimini - *Ariminium*, and published by Galli at the beginning of 2000s. Ceramic materials were collected in a complex context, whose life started before the foundation of the Roman colony

[81] BATS 1988, pp. 45-51.

[82] BATS 1988, pp. 65-70.

[83] Even if it is true that some new forms had been added during Roman times, cooking assemblages seem to remained more or less the same, underlining a substantial continuity between the two periods. Bats explains this situation in the light of Roman cultural policy that looked at Greece as a model to imitate, or better to assimilate. This resulted in an absolute adherence to Greek life-style, also in regard to eating habits, as both mobile findings and the structure of the colony suggest (BATS 1988, pp. 75-76).

Ariminium in 268 BC. A substantial transformation during the 2nd century AD completely changed the structure, and deleted the part of the *domus* devoted to productive activities.
This transformation coupled with the continuity of the site occupation, offered the unique opportunity to study the Romanization *phenomenon* through the evidence of everyday-life tools and instruments.
Galli performed a detailed analysis of both coarse ware and table ware, following the evolution of ceramic assemblages to identify dynamics of resistance-assimilation of local culture to foreign (i.e. Roman) influences. In his opinion, coarse ware is a conservative kind of pottery because eating and cooking habits tend to survive over a very long period; for this reason, modifications in cooking pot sets, testifying a change in cooking habits, indicate an in-depth integration between two cultures[84].
Regarding the *Ariminium* case, the author analysed the introduction, after the foundation of the Roman colony, of a peculiar coarse ware shape, the so-called *patella*, the pan used in central Italy to cook food, above all fishes, with the aid of a vegetable fat, i.e. oil. The introduction of the *patella* in *Ariminium* kitchen is considered by Galli a result of the influence of Roman citizens that determined a change in cooking and eating habits, from a local diet based mainly on cereals and game, usually stewed, to a Mediterranean dietary regime, that implicates the introduction of new foods, such as fishes and oil[85].

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[84] See GALLI 2001, pp. 224-225: "*La seguente ipotesi di lavoro si fonda sul presupposto che comportamenti connessi al regime alimentare, alle modalità della nutrizione e dell'assimilazione dei cibi tendono a sussistere nel tempo, malgrado i cambiamenti radicali intervenuti nella compagine sociale[…]. Muovendo da questa posizione antropologico di sostanziale conservatorismo delle pratiche alimentari, la ceramica, in quanto dipendente da due fattori, alimentazione e processo di preparazione – consumazione del cibo, può costituire a maggior ragione un indicatore particolarmente atto a documentare e verificare forme di stabilità, di assimilazione o di resistenza all'influsso di pressioni sociali e culturali esterne. In particolare poi la ceramica comune e, ancor più, il vasellame da cucina costituiscono un polo di resistenza alle forme di acculturazione*".
[85] The *patella* is not the only new shape introduced in *Ariminium domus* in the second half of the 3rd century BC; Galli also discussed the *clibanus*, that testify a new way of cooking (*sub testu),* as well as the introduction of new forms in table ware, that suggest also new ways of presenting and eating food (For a detailed description of innovation in cooking and table ware in the Republican period, see GALLI 2001, pp. 234-242).

Research of this kind, that used material culture as indicator of complex social dynamics, have led to the acquisition of variety of information. However, despite the important results obtained with this approach, it was not often followed in dealing with materials unearthed in Friuli Venezia Giulia archaeological sites.
Some scholars made some observations about cooking and eating habits testified by pottery assemblages, but so far only few examples for the use of coarse ware as indicator of food culture could be traced in bibliography.
Mirroring the interests for Medieval coarse ware, some authors focused their attention on the transition period between the end of the Roman Empire and the arrival of foreign populations. This period witnessed radical changes in eating and drinking habits, due to political overthrows, climate changes and new economic dynamics. All these transformations caused a modification in ceramic assemblages: the Medieval period is characterised by a reduction in the variability of shapes and by an evident predominance of *ollae*[86]. The composition of cooking ware sets has been linked to the increased importance of soups, stewed legumes and vegetables and boiled meat in the diet. Less spread in the Roman alimentary regime, these easier-to-handle food was at the core of the immigrants eating habits. Coarse ware from the Roman layers compared to pottery unearthed in the medieval levels of the excavation in Trieste-*Crosada* point to this kind of evolution[87]. Furthermore, it is likely that the morphological evolution of *ollae* reflected a general modification both in cooking habits and equipments[88].
For Friuli Venezia Giulia a cross-data examination on *Auerberg* pots presented at the 33rd *Settimana di studi aquileiesi*, hosted in Aquileia in

[86] A first analysis of the changes in cooking pots assemblages after the fall of the Roman Empire can be found in LAVAZZA, VITALI 1994, pp. 34-48, where the authors analysed ceramic materials unearthed in several Northern Italian settlements.
[87] BORZACCONI 2007, p. 381.
[88] See BORZACCONI 2007, p. 381: *"Le olle da fuoco subirono un'evoluzione morfologica in relazione al cambiamento delle abitudini alimentari, allorché la cottura a riverbero, tipica dei focolari bassi, fu sostituita, tra XV e XVI secolo, dalla cottura al di sopra di fonti di calore sistemate in strutture in muratura più ampie e solide, dotate di fornelli e di camino"*.

April 2002 led to a new understanding of stock farming on the south versant of the Alps[89].
A building in use between the 1st century BC to the 2nd century AD on the Monte Sorantri di Raveo produced a high number of *Auerberg* pots and an extremely elevated amount of animal bones[90].
A multidisciplinary analysis, joining archaeozoology, ceramology and gaschromatography, succeeded to explain how alpine farming and breeding of goats and sheep was done in Roman times.
It has been observed that at Monte Sorantri only animals within a well defined age range were butchered; since only adults cattle have been slaughtered, it means that they were purposely bred for their meet; furthermore, the different kind of bones unearthed and the presence on them of butchery traces, confirmed that butchering was performed on site[91].
Gaschromatographic analysis were executed on several *Auerberg* pots found on site, all characterised by a sort of covering applied on the surface of the vase, that makes the ceramic body oily when rubbed with the thumb. The analysis revealed that this covering is ram fat, suggesting that these vases were used as containers for sheep and goats meet preserved in fat (or, as less probable option, for tallow used for filling lamps)[92].
Auerberg pots with the same surface treatment have been found in several sites in a wide area, from North-Eastern Italy to Southern *Retia*,

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[89] The reference is to the above-mentioned paper *Produzione, funzione e commercializzazione dei vasi Auerberg nei territori di Aquileia, Tergeste, Forum Iulii, Iulium Carnicum e Iulia Concordia* that presents the most recent and comprehensive research about *Auerberg* pots in *X Regio.* (DONAT, MAGGI *et Alii* 2007).
Auerberg production are going to be fully analysed in the present work, see chapter 6.1.9, pp. 289-304.

[90] The general results of the excavations, undertaken within the project *I Celti in Friuli; archeologia, arte e storia* have been published in two articles in the local journal *Aquileia Nostra* (See VITRI, CORAZZA *et Alii* 2002 and VITRI, DONAT *et Alii* 2003).

[91] DONAT, MAGGI *et Alii* 2007, pp. 157-159.

[92] See DONAT, MAGGI, *et Alii* 2007, p. 160: "*Sulla base di queste considerazioni e del ritrovamento del Monte Sorantri riteniamo di poter proporre, come ipotesi plausibile, che nei contenitori venissero conservati e commercializzati carne di caprovini essiccata, affumicata o immersa nel grasso, oppure sego da utilizzare per l'illuminazione*".

suggesting that meat preserved in fat was filled into the *Auerberg* pots and shipped to different destinations within a quite broad area.
Furthermore, by enlarging the research to other uplands settlements, the authors were able to identify a relationship between *Auerberg* pots covered with ram fat and transhumant breeding; the identification of the containers enabled them to reconstruct the itineraries followed by cattle and shepherds, thus shading light on a traditional economic activity that remained important for the uplands throughout antiquity[93].
This study is the perfect evidence for both the high informative potential of coarse ware and the complex, multidisciplinary approach needed to exploit it at its best.
Coarse ware research is experiencing a growing interests; investigations now benefit from the newest scientific approach to archaeological studies added with archaeometrical analysis; thin section microscopic observation provide first class results when applied to this kind of ceramic materials.
Although coarse ware knowledge knew an extraordinary increment in the past years, both in increasing the understanding of this pottery production and in improving the study methods, this kind of comprehensive studies are still quite rare.
This is only one of the numerous problems still affecting coarse ware studies, that will be analysed in details in the next paragraph.

[93] For the reconstruction of the itineraries and for a list of the other elements supporting this theory, see DONAT, MAGGI *et Alii* 2007, pp. 162-164: "*È verosimile, comunque, che tutti i siti considerati, sebbene con funzioni diverse, siano da mettere in relazione con attività economiche afferenti alla transumanza*".

4.4 Open questions

Despite the growing interest on coarse ware studies has constantly improved the state of the art, this research branch is still affected by several gaps due to its state of 'infancy'[94].
The first issue that needs to be solved is a terminological one. Coarse ware still lacks a precise definition, shared across scholars and publications.
While in English-speaking countries *coarse ware* is the commonest label used for these un-slipped vessels, used for everyday tasks such as cooking, preparing and storing foods, some scholars adopt frequently different names, ranging from *kitchen ware*, to *house ware*, to *coarse house pottery*, to *utilitarian pottery* and others, more rarely used.
Italian publications employ a variety of denominations; until very recent time the commonest one was still *rozza terracotta scura*, proposed by Lamboglia. The other adopted labels derive sometimes from fabric features: *ceramica grezza, ceramica acroma, ceramica grossolana, ceramica ad impasto, ceramica a impasto grossolano.* Sometimes they instead suggest the vases' functional destination: *ceramica da cucina, ceramica utilitaria, ceramica da fuoco*. There are also some authors who, still following Mannoni's proposal[95], prefers the plural definition *ceramiche comuni*[96], that comprehends both locally produced and imported pottery, whose functional destination prevail over the aesthetic aspect[97].

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[94] As the brief history of science outlined at the beginning of the chapter showed, coarse ware started to be studied only from the second half on the 19th century, with a remarkable delay compared to other pottery analysis.

[95] See above, p. 72.

[96] This definition mirrors also another already mentioned problem that affects coarse ware studies, i.e. the consideration of these materials as a subgroup of common ware and not as a class *per se*.

[97] The definition of *ceramiche comuni* is still adopted in G. Olcese work on Ventimiglia - *Albintimilium* materials.
See OLCESE 1993, pp. 44-45: "*con essa [definizione] di intende il materiale ceramico rispondente a criteri di funzionalità, destinato alla cottura degli alimenti, alla loro preparazione e all'utilizzo per la mensa e per la conservazione, per cui l'aspetto estetico ha un ruolo secondario. […] La dizione 'ceramiche comuni', al plurale, utilizzata in questo lavoro, consente di considerare: A) le ceramiche comuni prodotte nel luogo di rinvenimento (per il consumo locale e regionale, ed*

German ceramology uses a wide range of definitions, spacing from *Grobkeramik* or *Gebrauchskeramik*, to *Grobgemagerte* or *Graue Ware* (sometimes simply shortened to *Grau Grob*), to *Kochgeschirr, Küchen- und Vorratsgeschir* and finally to *Hauskeramik*, this last underlining again the functional destination of this pottery.
The same happens also in French publications where denominations range from *céramique commune sombre* and *céramique grossière*, making references to the apparent technological simplicity and/or granular aspect of ceramic fabric, to *céramique non tournée*, *céramique modelée*, *céramique kaolinitique*, referring to some specific features of pottery fabric, *céramique domestique* and *céramique culinaire* alluding to their main functions.
This range of names is, at least in part, justified by the heterogeneity of materials belonging to this class of pottery, considered as a group mainly for fabric features, i.e. the granular, coarse look characterised by a variety of inclusions in the clay[98]. The long list of denominations provided above is a clear evidence of the difficulties to face in this kind of studies. The lack of an unified definition and label makes it really difficult to trace all the contributions, scattered in a wide variety of publications, partly hidden in reports or locally circulating journals[99]. This same uncertainty about denominations can be observed moving to single vases; not uncommonly, identical forms are called in different ways in different publications, complicating any comparison between

eventualmente per l'esportazione); B) le produzioni ceramiche comuni che, per la loro qualità o perché riflesso di situazioni economiche particolari, provengono da centri produttori esterni".

[98] See CORTI 2001, p. 120: "*Ceramica grezza, rozza terracotta, ceramica da cucina, ceramica d'impasto, sono queste alcune delle denominazioni date ad un insieme, nel suo complesso estremamente eterogeneo, di ceramiche caratterizzate dall'impiego di impasti con inclusioni di vario tipo, che contribuiscono a conferire ai manufatti un aspetto peculiare, apparentemente 'grezzo'*".

[99] This situation has been already enlighted in *Castelraimondo* publication. See BAROGI, COVIZZI 1995, p. 21: "*Sin dalle prime fasi del lavoro sono emerse difficoltà che hanno intralciato una rapida e precisa analisi delle pubblicazioni: il materiale presentato non sempre è stato analiticamente descritto, oppure compare sotto le più svariate diciture […] Uno dei sintomi più evidenti dell'incertezza che circonda questa classe ceramica è la vasta, eterogenea gamma di denominazioni che le sono state finora attribuite. Per citare solo le più diffuse e consolidate, 'rozza terracotta (scura)', acroma, acroma grezza, ceramica nuda, ceramica comune di uso domestico, ceramica grezza"*.

materials collected on different sites, and sometimes even on the same site, but studied in different moments or by different scholars. The same situation can be observed in the terminology adopted for vases components. Decorations and morphological features are often described using different words, not always with the same meaning.
Scholars have been perfectly aware of this inconvenient terminological heterogeneity from the nineteen nineties[100]. However, the lack of a shared vocabulary is a problem still affecting coarse ware, as testified by the fact that the majority of contributes opens the catalogue with a glossary, that explains the precise meaning of the various definitions adopted and the peculiar value they acquire within the work.
Already in the nineteen nineties, research on coarse wares led to the conclusion that the way to exploit its informative potential and to retrieve sensible results, is a comprehensive approach, that takes into consideration different aspects, from production, to vases' functional destination, as well as vessels' formal and decorative features[101].
However, the privileged point of view still lies in morphological studies, aiming at defining chrono-typological seriations. The predominance of morphological studies can be explained as an the

[100] See once again BAROGI, COVIZZI 1995, p. 21: "*Nella maggioranza dei casi, poi, nemmeno le descrizioni sono risolutive per individuare con sicurezza un manufatto in ceramica grezza. Infatti non è ancora entrato in uso uno schema descrittivo che sintetizzi gli elementi caratterizzanti questo tipo di classe ceramica e che si serva di un vocabolario tecnico normalizzato. Ciascuno studioso privilegia determinati parametri e si avvale di una propria terminologia, generalmente mutuata da altre classi ceramiche, che talvolta può risultare deviante*".

[101] In presenting the methodology adopted for researches on *Castelraimondo* coarse ware, still a benchmark for this kind of comprehensive studies on these materials, S. Santoro Bianchi said that the she and her team adopted a *multistage* approach, that proceeds through subsequent phases analyzing each object using different methods in a complementary way. Pottery types have thus been defined taking into consideration several different attributes, comprehending also results provided by archaeometric analysis. See SANTORO BIANCHI 1993, p. 176: "*La metodologia utilizzata come quadro teorico di riferimento nel corso della ricerca è stata quella messa a punto da C. Redman e che consiste, in estrema sintesi, in un approccio 'multistage' che per giungere all'identificazione dei tipi opera per stadi successivi, procedendo ad una selezione progressiva degli attributi con cui è definito l'oggetto di indagine, sino all'enucleazione della variabili 'chiave' o significative, quelle cioè che variano al variare delle coordinate spazio/tempo/funzione e come verifica utilizza approcci e metodi diversi impiegati in modo complementare. Questo modello è stato da noi integrato con quelle ricerche archeometriche la cui importanza nello studio della coarse ware è stata già da tempo sottolineata dalla scuola inglese di ceramologia*".

attempt to adapt the most widely accepted and used approach in pottery study, believing that a one-to-one correspondence between shapes and chronology could be applied even to a non-standardized *repertoire*.

However, within coarse ware materials, the majority of shape variants are of no importance; whenever fine ware methodology, that attaches a chronological value to each variation, has been applied to coarse ware, the outcome has resulted in an unmanageable quantity of variants, that underlined the uniqueness of each specimen instead of spotting similarities and regrouping individuals into types.

Traditional methodology used for fine ware productions could not provide effective results when applied to these materials, characterised by countless minor variations, due to the artisanal production and to the sometimes domestic fabrication[102].

This situation has been outlined and explained by S. Santoro Bianchi e M.P. Guermandi already in the nineteen nineties, in their introduction to results of *Castelraimondo* coarse ware study: "*Le pubblicazioni che hanno trattato questo materiale nell'ambito di scavi, con maggiore o minore attenzione, seguendo la tradizione degli studi di ceramica antica, hanno privilegiato gli studi morfologici presupponendo una corrispondenza biunivoca tra morfologia e cronologia, come avviene nelle ceramiche di produzione artigianale ma a carattere seriale. […] Il risultato di questi tentativi di classificazione morfologica, di materiale proveniente da insediamenti, è stato quello di una ingestibile quantità di varianti, derivante dall'aver voluto applicare a questo materiale che in realtà si modifica pochissimo nelle forme nel tempo, gli schemi di varianza applicati alle ceramiche fini modificabili nel tempo dalle mode e dai processi di produzione e affinamento tecnologici. Cosi,*

[102] Despite coarse ware is a very conservative class minor variations in some elements are extremely frequent as far as they do not affect the functionality of the vase. This is particularly true for some variations in rim morphology, that should be interpreted as results of a non-standardized production. See SANTORO BIANCHI 1990, p. 393: "*Non siamo ancora in grado di fornire ipotesi di sequenze cronologiche di forme, essendo le varianti minime, ma numerosissime nel tempo in questa classe ceramica e legate per lo più alla tradizione domestica dell'esecuzione degli orli [...] È questo uno dei limiti di uno studio molto dettagliato delle forme, o addirittura di alcuni dettagli, quali gli orli, per questo tipo di materiale; le varianti sono praticamente infinite, tante quante sono state le botteghe o addirittura le famiglie entro cui è stata prodotta questa ceramica di uso tanto quotidiano e di sostituzione tanto frequente*".

attraverso una dettagliatissima analiticità, si è dato conto piuttosto della unicità dei singoli pezzi"[103].

Morphological *criteria* turned out to be useless when applied to coarse ware also due to the very conservative nature of this pottery class, a featured explained by S. Santoro Bianchi recalling coarse ware practical destination for everyday uses. Once a clay recipe, a firing technique and a shape suitable for the practical purpose they were made for, had been found, there was no reason to change them, also because innovations were quite risky for ancient potters, whose knowledge relied on their experience. In this regard, developing a new form could have meant a real loss in both time and raw materials[104].

For these reasons, some forms and types have been used over centuries without considerable changes, making it very difficult to define a precise chronology only on the basis of shape details, especially in lack of stratigraphic information or in the presence of stratigraphically unmeaning disordered debris layers.

Already in the nineteen nineties the inadequacy of morphologic *criteria* to trace an evolution within coarse ware materials, either chronological or in productive processes, has been clearly stated by some scholars[105].

This critique pushed towards the classification of ceramic types according to their function/s. Also this approach did not prove completely successful when applied to coarse ware materials, perfectly

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[103] SANTORO BIANCHI, GUERMANDI 1995, p. 8.

[104] See SANTORO BIANCHI 1990, p. 393: "*L'introduzione di un'innovazione, anche formale, è carica di conseguenze, e quindi di rischi sul risultato finale del processo produttivo […] Un'innovazione è quindi rischiosa, richiede una sperimentazione che comporta un costo aggiuntivo, una serie di prove fallite con perdita di materiale e spreco di combustibile. Un vasaio tradizionale è normalmente molto diffidente nei confronti delle novità, perché non può sopportare il costo della sperimentazione*".

[105] See SANTORO BIANCHI 1993, p. 177: "*La ceramica grezza è stata trattata generalmente dalla letteratura archeologica nell'ambito della ceramica comune, senza particolare attenzione alle sue peculiarità, che riguardano soprattutto i caratteri chimico-fisici dei corpi ceramici e la loro intenzionalità in rapporto ad un uso previsionale. Questa posizione di sottoinsieme di una ceramica tipicamente romana ha condotto a privilegiare gli aspetti di carattere morfologico, che in questo particolare materiale a forte tradizione protostorica sono contraddistinti, come si è detto, da una grande persistenza di forme – e probabilmente di usi e di valori – tradizionali così da non riuscire a restituire un'articolazione né cronologica né produttiva*".

adapted to a variety of purposes [106]. In most of the cases it is impossible to determine to what extent vessels were made purposely for a single specific use, and it can never be excluded that a pot made with a precise functional destination, was used, during its life, to fulfil other and mostly multiple needs[107].

The inadequacy of a coarse ware study that adopts solely either a morphological or a functional approach is obvious; seriations so far produced, regardless of using traditional or digital methods, provided very poor results. After more than fifty years, coarse ware still fails to rely on a trustable reference typology[108].

In the second half of the 20th century this situation was connected to the belief that coarse ware was locally produced; for this reason, existing classifications were considered valid only for the micro-area where pots were found. The acknowledgment that coarse wares could be traded, and that some shapes could have been spread also by itinerant craftsmen, led to the creation of classifications hold to be valid on a wider range, at least for some territories considered homogeneous[109]. These classifications could be obtained only through a

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[106] See BAROGGI, COVIZZI 1995, p. 26: "*Anche la classificazione funzionale [...] pone un'alternativa alla morfologia tradizionale, ma il criterio della funzione, sul quale si basa, non è adeguato alle caratteristiche della ceramica grezza. Infatti proprio la sua economicità e la gamma limitata delle forme che venivano prodotte la rendevano presumibilmente molto versatile rispetto all'uso*".

[107] Is once again S. Santoro Bianchi who points out these issues. See SANTORO BIANCHI 1990, p. 388: "*Non sappiamo però se la funzione fosse sempre e specificatamente prevista dal vasaio, o se la stessa forma e tipo fossero usati, a seconda delle necessità, per contenere o per cuocere […] È questo anche uno dei motivi per cui all'interno della ceramica grezza una divisione per funzioni appare piuttosto arbitraria: la nostra possibilità di risalire alla funzione prevista dal vasaio è scarsa, e questa può poi non coincidere affatto con l'uso reale che dell'oggetto è stato fatto, eventualmente mutato nel tempo dal momento che lo stesso contenitore può avere svolto funzioni molto diverse nel corso della sua vita*".

[108] It is maybe the main feature that diversify coarse ware from other ancient productions, like for example *terra sigillata* or *amphorae*, whose standardization and production in series allow, since the end of the 19th century, the creation of typologies applicable to materials from different sites and still considered benchmarks for the study of these materials.

[109] In a quite recent work, G. Olcese, adopting a multidisciplinary approach that comprehends both traditional archaeological studies (morphological description and identification of functions) and innovative archaeometric techniques, delineated a coarse ware typology considered to be valid for a broad area coinciding with the nowadays

multidisciplinary approach to coarse ware study, so far adopted only for materials collected on Central and Southern Italy sites, while the North, and particularly the North East, still waits for regional studies.
In particular, Friuli Venezia Giulia requires a typological classification of coarse ware suitable on a regional level; although recent studies accentuated a widespread regional circulation[110], coarse ware is still mainly considered by scholars dealing with material unearthed within the former *Regio* X, as a local commodity that does not need a closer look at the possible resemblance with distant relatives. Furthermore, since already existing typologies have been frequently presented only through local journals and minor publications, they knew only a restricted circulation, failing to get accepted in the scientific debate[111].
This situation mirrors another problem: the absence of an unitary vision across scholars and the lack of common goals. The growing number of works devoted to coarse ware remain frequently isolated; with the exception of very rare attempts, the majority of contributes deal only with one or few sites, without any effort to outline a broader picture. Furthermore coarse ware research in the *Regio X* has been published, and still is, on individual patterns, making it very difficult to compare different situations and thus preventing the outlining of a comprehensive framework for coarse ware production and distribution in the region.
Finally, it has to be acknowledged that coarse ware studies in Friuli Venezia Giulia still lacks a shared and commonly accepted

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Lazio, that during the period analysed (3rd century BC - 1st century AD) shared a quite homogenous culture. The detailed study and the typology created allowed the author to retrieve from coarse ware some interesting information about eating and cooking habits and their modifications through times and about the organization of pottery production and distribution within the analysed territory (see OLCESE 2003).

[110] Some of these studies have been already mentioned and their results have been discussed above. See paragraph 4.2, pp. 80-96.

[111] The problem is clearly stated by P. Donat, explaining the reason why for her research she developed for coarse ware a customized typology. See DONAT 2010, vol.II, pp. 30-31: "*Per alcune forme in ceramica comune depurata (mortai, anfore di piccole dimensioni, brocche, bottiglie) e per le olle (in ceramica da fuoco, ceramica comune ad impasto non depurato, ceramica ad impasto di grafite) è stata creata una nuova tipologia, visto che quelle già proposte in letteratura per i singoli tipi non erano state recepite negli studi successivi e quindi non sarebbero state facilmente riconoscibili*".

methodology; every team still adopts a self-centred point of view, remaining in an outdated, chaotic and incongruous situation that does not invite to spot similarities and differences across different sites.
After the pioneering attempt made for *Castelraimondo* thirty years ago, coarse wares studies have suffered for the absence of a collective approach and targets that, in other Italian regions, allowed scholars to go beyond the use of pottery merely as a dating tool, and to exploit the potential of coarse ware studies for a general reconstruction of socio-economic dynamics.
To reach this goals, an in-depth integration between traditional approaches and the most advanced archaeometric analysis methodologies is needed, moving away from the consideration of archaeometric analysis only as an appendix, but interpreting the results in the light of more general questions[112].
However, the application of archaeometric analysis to pottery finds, and to coarse ware, has been welcomed within Friulian studies only very recently, and the learning process to put the right questions to the right specialists is not yet completed.
This peculiar situation is due, at least partially, to the absence of local laboratories that could be a reference for all the scholars. This forced to send samples to external research facilities, increasing the costs of the analysis themselves, and, besides, preventing the creation of a regional database for both local raw clays and ceramic artefacts. This situation turns out to minimize the necessary discussion between ceramologists and archaeometrists[113].

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[112] Already in the nineteen nineties G. Olcese noticed this lack of integration of results provided by traditional and archaeometric approach to archaeological pottery, claiming that, on the one side, archaeologists passively accepted archaeometric *data*, never discussing their authenticity, but on the other, they just relegate them at the end of the study, without integrating them with results provided by more traditional approaches. See OLCESE 1993, p. 52: "*Attualmente, in Italia, sono ancora pochi i lavori inerenti la ceramica antica e medievale in cui avvenga una piena compenetrazione tra analisi stilistico/morfologica e risultati delle analisi di laboratorio. L'atteggiamento generale oscilla tra un'incondizionata fiducia nei confronti dell'analisi di laboratorio, interpretata non come ipotesi più sicura di lavoro ma come verità assoluta e, dall'altra parte, una diffidenza nei confronti dell'approccio scientifico, i cui risultati vengono relegati in un'appendice finale, per lo più inutilizzata*".
[113] These and others problems that prevent an effective application of archaeometric analysis on ceramic materials unearthed in Friuli Venezia Giulia have been widely

Furthermore, mirroring that fragmentation of studies outlined above, archaeometric analysis are mainly performed on individual sites, and/or sometimes even on a single form or sherd[114], decreasing the possibility to tackle broader issues, such as a general reconstruction of regional patterns of distribution and trade routes, within the region and abroad.

To conclude, the *panorama* outlined clearly illustrates that, despite the growing number of studies on coarse ware, a number of open issues still need to be solved, especially when dealing with materials from North-Eastern Italy. Successful models from other regions indicate that the path to follow in order to exploit at its best coarse ware informative potential is to adopt a multidisciplinary study, joining finds from different, and different kind of, sites.

Adopting this approach also to coarse ware collected in the former *Regio X*, as the present study aims to, will make it possible to better exploit its informative potential, enabling to reconstruct, also for this region, pattern of production and distribution, and to outline the chronological evolution of this kind of pottery. The growing number of comprehensive studies will also lead to solve at least some of the problems that still affect this kind of research, while opening new questions that are going to further develop our knowledge about this pottery production.

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explained by P. Ventura in her PhD thesis, that also contains a detailed and up-to-date review of archaeometric techniques applications on archaeological materials unearthed in Frili Venezia Giulia. See VENTURA 2014, pp. 128-144 and, in particular, pp. 139-144 for a review of archaeometric analysis applied to coarse ware.

[114] It is the case of the study on *Auerberg* pots, that, even taking into consideration materials from different sites, analysed only one peculiar vase within the countless coarse ware productions. See above, chapter 4.3, pp. 103-105 and mentioned bibliography.

Chapter 5

Methodological *criteria* for the study of *Stella 1* coarse ware

The core of the present research are coarse ware brought to light within the framework of the *Anaxum Project* during four underwater archaeological excavation campaigns performed between 2013 and 2016.
During these investigations, 208 square meters within the area of scattered artefacts were explored (see *figure 1*), bringing back 729 coarse ware fragments.
The first approach was to quantify the vases belonging to the context and to identify their total.
In the present research, the estimation of the *minimum number of vessels* has been chosen among the commonest archaeological methods attested in the literature to obtain a reliable quantification[1].
Previous studies determine that the number reconstructed adopting this method provide a figure equal to, or less than, the actual number of vessels represented[2].

[1] For a brief overview of the method, see ORTON 1989.
[2] ORTON 1989, p. 94.

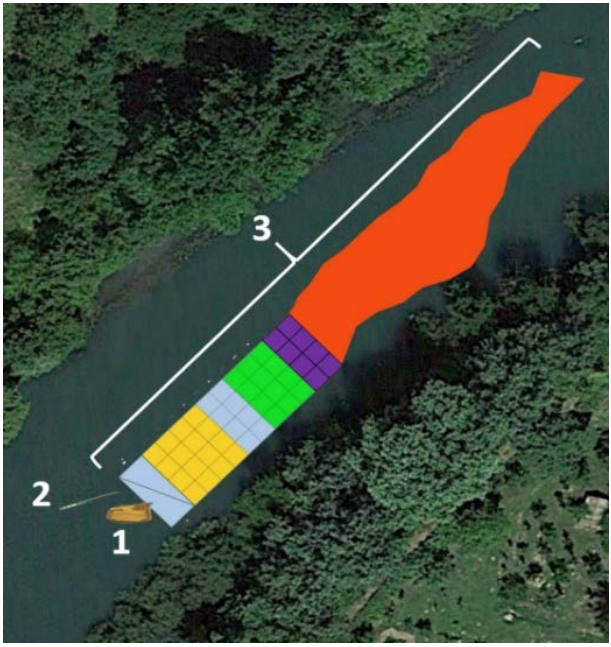

Fig. 1. The complex site Stella 1*; within the area of scattered artefacts the squares investigated during the 2013-2016 excavations are marked in different colours. The red zone represents the portion of the area that is still to be explored. (Prof. M. Capulli's elaboration)*

In a first step, matching fragments were assembled in order to reconstruct each form as far as possible; also pieces surely belonging to the same form, even if they do not physically join the reconstruction, were assigned to the same individual.

It is common knowledge that this method tends to under-estimate the true number; however it seems to be the most feasible with *Stella 1* coarse ware characteristics.

The extreme variability of a non-standardized production as coarse ware, makes it impossible to use the sherds' weight as a parameter to define the individual number of vases in the assemblage. The weight of all the materials proved to be useful with standardise productions when, starting from a fragment, it is possible to determine the whole vase weight and when the majority of the pieces in an assemblage

could be identified as belonging to a known vessel type[3]. Unfortunately, it is not the case of coarse ware in general, and of *Stella 1* materials in particular.

More complex calculations, based on statistical principles that take into consideration multiple variables have been proposed for pottery collected in stratigraphic contexts and/or belonging to more standardised productions[4].

Scholars now acknowledge that the most reliable measurements is to calculate the estimated vessel-equivalent (*eve*), that considered each sherd as a fraction of the whole vase. This method best apply to mould-made and/or highly standardised vessels, whose dimension remained always the same and are now well known thanks to a well established tradition of studies; it is on the other side difficult to apply it to a class like coarse ware, within which the dimensional variability is very high.

Eve is the starting value needed to more complex analysis, that apply common statistical evaluations and that turned out to be particularly useful in order to assess the percentage with which each class of pottery is attested within a completely investigated assemblage. Further calculations enable also to compare *data* from different layers, allowing an appreciation of the pottery variability across time and space[5].

Applying these complex *formula* to the materials collected in the *Stella 1* site appeared however to be time-consuming and useless since the area of scattered artefact lacks a well defined stratigraphy and it could be considered a homogenous context, simultaneously constituted.

Furthermore, the area of scattered artefacts has not been fully excavated yet; thus even the more accurate statistical calculation would not mirror the real quantity of materials belonging to the site.

Finally, the extreme internal variability of coarse ware vases made it impossible to clearly assess the *eve*, since each sherd could represent a different percentage of the whole vessel.

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[3] ORTON, TYERS 1990, p. 84.

[4] In the following lines the most used methodologies are going to be quickly mentioned and explained; for a comprehensive summary (with further bibliography) see ORTON, TYRES, VINCE 1993, pp. 168-181.

[5] For a detailed description of the method, see ORTON 1975.

For all these reasons, defining the *minimum number of vessels* was considered sufficient for the purposes of the present research and for this initial phase of *Stella 1* coarse ware study.
Joining the matching sherds and grouping the ones that surely belong to the same vessel testifies that the 729 fragments belong to 313 vases, some of them reconstructed in their totality, some other almost completely reassembled. 218 vase are represented by a single shred.
Reconstructing entire forms make it easier to identify *sherds' families* and to assign to certain shapes also some non-diagnostic fragments, improving the informative potential of the whole assemblage and making the results more consistent.
After the assessment of these quantitative *data*, the subsequent study of the *Stella 1* coarse ware consists of two main phases. Both of them turned out to be essential and intertwined, since the second one could not have been possible without the first one and since they provide different kinds of information.
The first step encompasses a morphological study, the final aim being the creation of the customized typology presented in the catalogue (see below, chapter 6). The morpho-typological approach provide useful insights for a deeper comprehension of the site. Indeed the analysis of the morphological and technological features of the vases, as well as the examination of possible trace of use, allow to:
- surely identify the stream of artefacts as a homogeneous and anthropic deposit;
- asses the chronology and the function of the objects in the context;
- shed light on the nature of the deposit and the reasons of its composition.
The identification of some pottery types already known in the literature makes it possible the second phase of the study, i.e. the comparison of the *Stella 1* archaeological deposit with other sites both within and beyond the borders of the Aquileia's territory and *Regio X*. One of the outcomes of the comparative study has been the creation of distribution maps for the most meaningful vessels' type identified; this provides a summary of the distribution of each type, recording its presence on different sites.

This second step of the study enables to widen the research horizons, looking beyond the borders of *Stella 1* site. In this way, it has been possible to consider coarse ware here collected in the wider framework of the regional pottery. Comparative and distributive studies thus enables to infer hypothesis about the system of coarse ware production and trade in the Aquileia's territory, and, more generally, in the *Regio X*. Sometimes, as it is going to be further discussed in the next chapters, it was also possible to identify coarse ware type with a supra-regional diffusion, enlightening the complex system of trade and distribution that involves also this kind of pottery.

5.1 Typological classification

A tailored typology for *Stella 1* coarse has been proposed to tackle the whole variety of materials collected during the *Anaxum Project* excavations. Existing classifications of regional coarse ware were created for assemblages usually found on specific sites and turned out to be useless on a regional level[6].
Being aware of the multidisciplinary approach needed to exploit coarse ware informative potential[7], the typology remains based mainly on morphological *criteria*. A fabric classification would have been indeed useless due to the post-depositional environment of *Stella 1*. Archaeometric analysis were not performed since the effects of the prolonged permanence in the water in some cases deeply altered the pottery. Some features that now seem to characterize the pottery fabric could be the results of the post-depositional environment and could not mirror technological choices made by ancient potters. Water can deeply alter pottery fabric, wearing the surface, sometimes causing the loss of

[6] See chapter 4.4, pp. 112-113.
[7] It is worthy to remind, for the *Regio X*, the research lead by S. Santoro, that widely demonstrate how coarse ware could be a precious source of information about eating and living habits, technological knowledge, practices and establishments, organization of production as well as trades and circulation instruments and routes (see especially SANTORO BIANCHI 2003, p. 327 and cited works).

inclusion, and in some cases even inducing the degradation of chemical compounds; the effects of water on the ceramic surface can be frequently appreciated even through macroscopical observation[8] .
Frequently on the surface of vases recomposed by fragments collected in different spots is possible to notice several differences that obviously do not reflect an original diversity in pottery fabric but rather post-depositional processes, that can be slightly different even in different areas of the same context (see *figure 2*).

Fig. 2. An olla reconstructed from different fragments collected within the area of scattered artefacts. Every single fragment presents a different level of degradation of the ceramic surface, caused by the prolonged permanence in the river

For the same reason, also a macroscopical observation and description of ceramic fabrics has not been considered as distinctive *criterion* to develop the typology. Due to the peculiar condition of preservation, the optical analysis of fabric could lead to wrong results.
Ceramic fabric is however the main feature that differentiates and identifies coarse ware; for this reason, a detailed description of the fabric is provided for each type and/or variant. Indeed, the identified morphological groups seem to be consistent also from a technological point of view and at least in some cases evident fabric differences were used as distinctive *criterion* to identify variants within morphological types.
Fabric description follows parameters already identified in the dedicated literature for the macroscopical observation of pottery[9].

[8] For a complete list of the effects caused on pottery by a prolonged permanence in water, see MUSTAČEK 2014.

The fabric description thus comprehends:
- the feel of sherds' surfaces when rubbed with the thumb;
- size and frequency of inclusions and impurities. According to their size, inclusions could be fine, medium or coarse. Frequency is described as sparse, moderate or frequent;
- the possible presence of surface treatments (polishing, burnishing, slip coating), indicating if the description applies to the exterior and/or the interior surface;
- the thickness of vessels walls, a parameter that could sometimes suggest whether the vase was hand-made or wheel-thrown.

When considerable variations in fabric occur within the same type, they are noted and emphasised, since they could be meaningful for technology and manufacturing. Furthermore, if a single vase is characterised by a fabric different from the standard of the type it belongs to, its individual fabric is described separately.

The colour, usually considered as a distinguishing *criterion* in fabric studies, is not included in the present research as discriminating factor. The decision was linked once again to both the intrinsic features of coarse ware and the post-depositional environment of *Stella 1* artefacts. Coarse ware vases were frequently fired at low temperature, sometimes in very rudimental kiln or even in open bonfire. Unstable temperature and atmosphere, short-lived changes in firing condition, uneven or insufficient cooling process could lead to different colour even for vases made with the same raw materials.

Furthermore, the same vase could be characterised by zones that completed the oxidation-reduction process at different level, thus presenting colour variations.

Sometimes even the position of the vase in the kiln could cause an alternation, in the same pottery, of over-fired and almost un-baked area, resulting also in this case in a non-homogeneous surface colour.

Finally, since coarse ware were usually produced using non-purified clay, the colour of the vase surface is highly affected not only by

[9] These classification *criteria* and their effectiveness in describing pottery fabric are presented and analysed in ORTON, TIRES, VINCE 1993, pp. 67-75, pp. 135-140 and pp. 231-242.

irregular firing conditions but also by uneven clay composition (see *figure 3*).

Fig. 3. An olla collected in the area of scattered artefacts. A great colour variation due to uneven firing conditions can be appreciated on its surface

Given this situation, colour could not be used as a discriminating factor in coarse ware fabric description. This is particularly true in dealing with fragments: since the colour can change even within a single pot, it is impossible to consider colour as relevant *criterion* to assess the belonging of a fragment to a peculiar type.

Furthermore, the post-depositional environment can causes further alterations, further preventing from considering colour an effective distinctive feature.

An high number *Stella 1* artefacts, belonging to all the archaeological classes, presents some red-purple area on the surface.

Analysis performed in 2000 by the scientific laboratories of the *Soprintendenza ai Beni Artistici e Storici di Venezia* revealed that these colour alterations are caused by some *thalli* belonging to a red alga, *Hildebrandia rivularis.* This alga, very common in rivers and freshwaters, produces crustose forms of *thalli*, perfectly adherent to the surface of the host and difficult to remove[10].

Sometimes the alga covered almost the entire surface of the collected fragments, making it impossible to assess the real colour of the vase.

Removing the *thalli* without the due attention and expertise can ruin the archaeological artefact, taking away some external layers. For this reason, despite the alteration it causes to the archaeological materials, it has been decided not to remove the alga, since it was impossible to adequately treat all the materials.

[10] I would like to thank professor M. Capulli who kindly shared this information with me.

An high percentage of *Stella 1* coarse ware is highly affected by *Hildebrandia rivularis* (see *figure 4*); as a result, surface colour has not been considered in developing a consistent typology.

Fig 4. A coarse ware fragment whose red-purple colour is the effect of Hildebrandia rivularis

Typological classification of *Stella 1* coarse ware was structured around morphological features, studied under the light of the vases' function(s).

In defining each type were observed firstly the characteristics of complete or almost entirely reconstructed vases, that represent a quite consistent number within the whole assemblage.

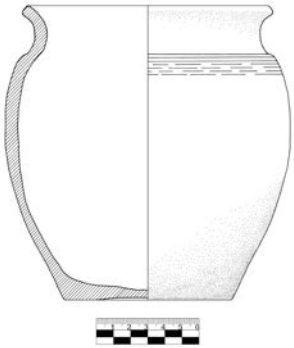
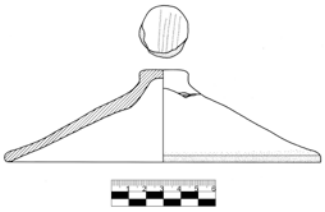
The first step of the classification consisted in dividing the pottery assemblage in basic functional classes, focusing the attention on the use made in antiquity of the different vessels.

Classification following the function turned out to be essential for getting insights on the pottery assemblage and to assess the nature of the specific archaeological deposit as well as for provenience studies.

The inconsistent use of a shared terminology for basic coarse ware types[11] led to the attempt of setting-up a customized, clear and logic vocabulary, creating a personalised *lexicon*. In some cases the name given to ancient vessels is the same still today; in some other, its meaning is familiar to archaeologists.

[11] See chapter 4, pp. 69-114.

Stella 1 coarse ware was thus divided in *ollae*, lids, beakers, pans, bowls and platter, mirroring a typical coarse ware characteristic, i.e. the restricted number of forms.
In order to provide the reader unambiguous definitions, names of the pottery forms here adopted and their relative functions, as well as a brief lists of alternative denominations that can be found in current literature, are summarised in the table below (*table 1*) and are going to be further explained in the next lines.

Name	Graphic representation	Function(s)	Alternative names
Olla		Cook (boil) Storage Transport	Pot; Urn; Casserole; Closed vessel
Lid		Cover Close Protect	*Operculum*; Cover

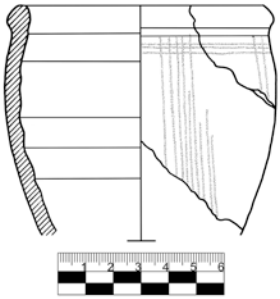
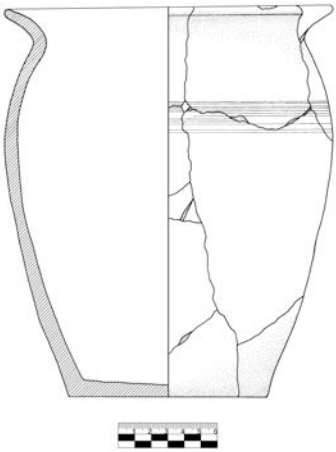
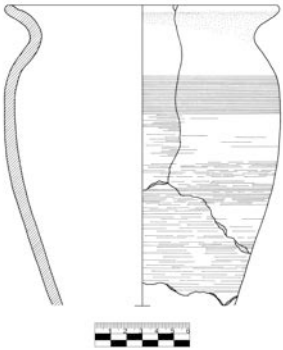
Beaker		Drink	*Poculum*; Goblet
Pan		Cook (frying or baking)	*Patella*; *Cumanae Testae*; *Testum*; Saucepan
Bowl		Serving Store Cook	Dish; Deep dish; Pan
Platter		Serving	Plate; Dish

Table 1. Name(s) and function(s) adopted for Stella 1 *coarse ware*

The name ***olla*** has been chosen to indicate a close-shaped vase, with a globular, cylindrical or oval body, a rim diameter greater than 10 centimetres and a flat base. The decision to keep the Latin name was supported because it is widely used in Roma ceramological studies. The Latin name solve the problem to find a modern word able to encompass the whole variety of this vase functions. As suggested by

ancient literary sources[12], *ollae* were used to cook, store and transport liquid and solid foods. Archaeological evidences confirm also a common re-use as cinerary urns.
As the modern equivalent, **lids** were used to cover both open and closed vases. *Stella 1* coarse ware lids are characterised by a central knob.
Small vases that can be held in one hands are defined as **beakers**. They are closed forms, with a rim diameter measuring less than 10 centimetres. They were vessels produced to be used by a single person, characterised by a small capacity.
Pans are open-form vases, characterised by vertical or slightly inclined walls and a rim diameter larger than the maximum height. They belong to the open forms used mostly for frying and baking and sometimes for serving.
Bowls are open form as well, characterised by inward curving walls. They were mainly used as individual serving vessels, but sometimes they could have been used also to temporarily store foods.
A single vase characterised by a very large diameter and a small height has been defined as **platter**.
Within each class, subdivision was done according mainly to morphological features, with some partial exceptions, that are going to be fully detailed in the next chapter, presenting each type.
Each form represented at least twice has been considered a type and has been given a number in the main classification sequence. Following this *criterion* it has been possible to define, within some of the types, variants that share the main features of the type but show consistent and visible changes in some attributes (see the *table 2* below for an example).

[12] See ISID., *Orig*. 20.8,1; VARR., *L.L.*, 11.5, 108; CATO., *Agr.*, 86, just to mention the most famous ones.

<table>
<tr><td colspan="3">Ollae 2
Ovoid body, everted rim with a round edge.
Quite frequent and well sorted fine glistering flakes of mica and sparse, medium and coarse sharp-edged grains, usually white in colour, that could be either calcite or quartz.</td></tr>
<tr><td>Ollae 2a</td><td>  </td><td>Everted and thinned rim, with a round edge. Long rims turn seamlessly into the body, almost without a neck.</td></tr>
<tr><td>Ollae 2b</td><td>  </td><td>The inner surface of the rim is slightly flattened and presents a small groove, interpreted as a lid seat.</td></tr>
</table>

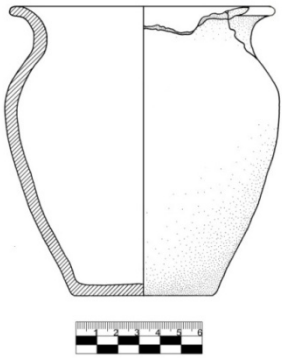
Ollae 2c		A visible neck constriction and a sharper separation between rim and body. The vessel thus presents a more curvy and well defined, s-shaped profile.

Table 2: An example of the definition of variants within a type

A partial exception to this methodology of classification has been applied to vases that, although attested by only one sample in the analysed assemblage, have been considered as type or variant, since they represent form already well known and studied in the *Regio X* and beyond[13].

Unica were classified as ***varia***; they constitute a negligible percentage of the assemblage, and confirm the consistency of the created typology.

All fragments too small for characterisation were not specifically defined.

No existing classification proved to be successful in representing all the types identified within *Stella 1* coarse ware; however the morpho-typological classification here presented offers some similarities with recent seriations for *Regio X* materials.

Whenever possible, the customized name adopted for *Stella 1* types were flanked by already existing and widely accepted names, in order to move towards the acquisition of a shared vocabulary; furthermore, using the same names makes comparison easier. An example will clarify this: *ollae 7* are also called *ollae Cassani I-III* since they have been

[13] A telling example of this is the isolation, within the classification of the *ollae* of one single fragment recognised as belonging to an *Auerberg olla*. In this case, even if the type is attested in the analysed assemblage only by one fragment, it has been isolated as representative of a well-known form. Thus the single fragment constitutes a type on its own.

identified with a type already defined by G. Cassani in the her study on coarse ware unearthed in the Pavia di Udine *villa rustica*[14].
The morpho-typological classification has been realised to speed the archaeological work, being aware that it do not simulate antique realities. Classifications rarely mirror cultural *phenomena* and it is likely that ancient populations did not even perceive the differences we consider as discriminating factors[15].
Groups were created paying more attention to similarities among vases, while minor morphological differences were disregarded. The focus has been set mainly on quantitative features rather that than on qualitative attributes. The first ones seem indeed to provide more information about the vessels' functions and use.

5.2 Comparative study

Following the classification, pottery found on *Stella 1* site has been compared with materials from various published archaeological sites, in an effort to plot the distribution of coarse ware in the immediate surroundings, subsequently enlarging the territory analysed.
This phase was essential to assess the chronology of *Stella 1* pottery and to finally date the site itself, comparing its finds with well dated contexts.
Comparative research has also been fundamental since, especially for the purposes of the present research, the site cannot be considered as an isolated archaeological deposit, but has to be seen in its relationships with the surroundings territories.
From the very beginning of the work, the decision was to include in the study only published *data*. Unpublished materials preserved in Museums and Superintendences storerooms and archives, although very numerous, would have complicated the evaluation without adding proper results.

[14] See next chapter, especially 6.1.7. *Ollae 7/Olle Cassani/ Olle Pavia di Udine I-III*, pp. 254-259, for a more detailed presentation and for further considerations.
[15] CAZZELLA 1999, p. 16.

Not all the unpublished contexts are easily accessible[16] and the differences among Museums and Superintendences storerooms, as well as the variable quality of records, would have inevitably affected the quality of information. Some storerooms are in need of restructuring and some old finds are difficult to locate; this would have led to an uneven distribution of *data*.

Following the necessity to deal with homogeneous sets of *data*, attention was mainly focused on contexts recently excavated with standardized documentation and reports.

Based on published materials only, maps of coarse ware distribution provided here represent only the beginning of a programme far from being complete, which ought to include petrographic, mineralogical and chemical analysis of both pottery and raw materials. However, the review of edited materials proved successful on different levels.

Information previously scattered in countless reports of archaeological excavations, papers, bulletins, books, distributive charts, *etc*. can now be assessed in one single place.

As it is going to be shown in next pages, the results give a framework of coarse ware distribution in the entire Northern Italy during Roman times, that, even if not complete, is at least meaningful and telling,.

Sites studied for comparison were selected subsequently increasing the territory analysed, according to territorial units.

In a first step, focus pointed on discoveries along the *Stella/Anaxum* banks and/or within the river basin. Given the proximity with the *Stella1* site, finds from this area were likely to share the highest number of similarities with the ones collected within the underwater archaeological deposit.

The *Stella/Anaxum* basin comprehends the modern municipality of Sedegliano, Codroipo, Rivignano, Teor, Pocenia, Palazzolo dello Stella, Muzzana del Turgnano e Precenicco.

The review started from the essential publication *L'assetto insediativo di età romana nell'agro sud-occidentale di Aquileia*, published by P. Maggi in 1992[17]. Using both archival information and new evidences provided

[16] Due to temporary inaccessibility of some local Museums, the finds stored there could not be studied.

[17] From this moment on, simply MAGGI 1992b.

by field survey, the author listed 98 archaeological sites dated to Roman times. The materials collected in the different sites enabled to identify 9 burial places (most of them rural incineration necropolis) and a number of residential areas, further distinguished in 25 *villae rusticae* and more than 60 rural settlements (*fattorie*) (see *figure 5*)[18].

Information provided by this work were braided with the catalogue of the exposition *Il bacino dello Stella in età romana*[19], full of accurate information about the settlements organization within the river basin and that firstly presented, already in the nineteen nineties, a meaningful selection of local finds.

Finally, the recently published volumes of the series *Presenze romane nel territorio del Medio Friuli* completed the documentation. The materials collected, both during archaeological research or by private citizens, in the sites tackled by the series furnished a more than exhaustive documentation of the archaeological finds of the *Stella/Anaxum* basin.

Particular attention was given to pottery workshops, kilns and *villae rusticae,* since materials from these sites provide useful insights on the traded goods of the *Stella 1* site. The comparison with the finds from *Stella 1* site suggested that at least some materials from the area of scattered artefacts were locally made.

Furthermore, the relatively high number of sites attesting pottery manufacturing confirmed the *Stella/Anaxum* basin as one of the most important productive areas within the Aquileia's territory[20].

[18] For the detailed list, see MAGGI 1992b, p. 199.

[19] From this moment on, *Bacino dello Stella*.

[20] See chapter 2.2, pp. 19-27.

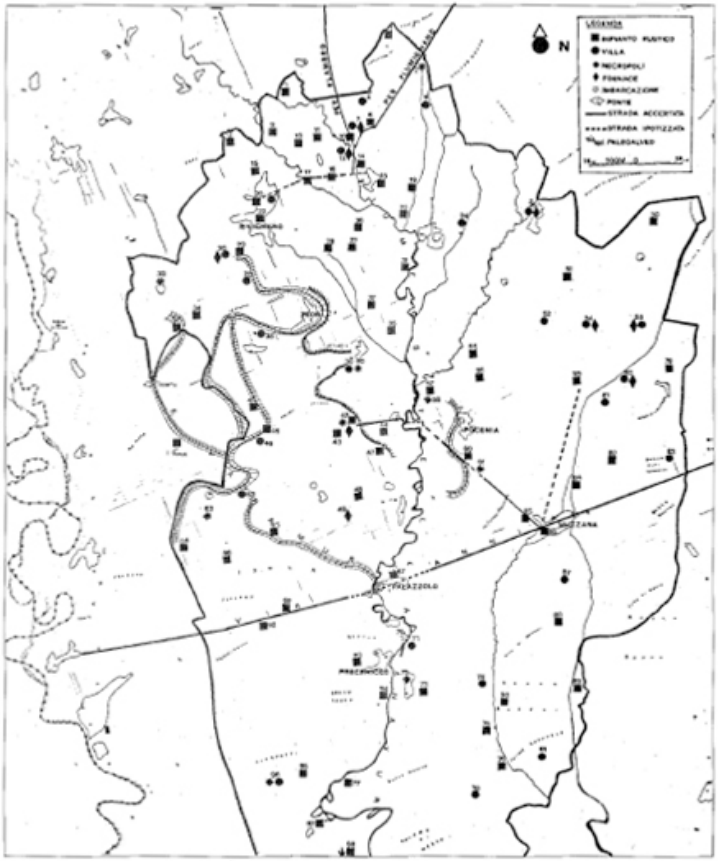


Fig. 5. Archaeological sites in the Stella *basin during roman time*
(From MAGGI 1992b, *fig. 5, p. 198)*

Research has been then enlarged to the whole territory of the ancient Roman colony. The identification of the *ager Aquileiensis* borders is still an issue to be solved.

As suggested by ancient literary sources, Western border follows the river *Tagliamento*, while the Eastern one coincides with the river *Isonzo* and its mouth[21].

The Southern border is defined by the Northern Adriatic seashores, and comprehends the lagoon of Marano and Grado while the Northern

[21] DE FRANCECHINI 1998, p. 341.

border remains under discussion. Some authors, adopting a large *criterion*, included in the Aquileia's *ager* sites on the hills and the Vipacco valley[22]. In the lack of a common definition of Northern border of the Aquileia's territory, for the purposes of the present study settlements on the hills were separately considered. For this reason, they appear in the comparative table in *Appendix I* under the label *Carnia*.

The aim of identifying the dynamics of pottery production and exchange forbids a restriction within the borders of territorial unit as small as the *ager* of Aquileia. Furthermore, bricks and tiles collected on the *Stella 1* site presented evidences for a circulation of *Stella* basin products on a wider scale. This led to encompass in the analysis the *Regio X* in its total extension.

Regio X comprehends a wide territory from the foots of the Alps to the Adriatic seashores, corresponding to nowadays Lombardia, Veneto, Trentino Alto Adige, Friuli Venezia Giulia and part of *Histria* and Western Slovenia[23].

However, the extension of the regional territory is still being discussed by scholars, because the main source, a passage of the *Naturalis Historia* by Pliny the Elder, remains vague and ambiguous for its Northern and Eastern boundaries[24]. Moreover, administrative borders changed throughout times, from the constitution of *Regio X* by the Emperor Augustus to the end of the Roman Empire.

In the present research, the *Regio X* has been considered as the territory whose boundaries are defined:

- on the South, by the Adriatic Sea and the river Po;
- on the West, by the Iseo Lake and the river Oglio;
- on the North, by the Alps;
- on the East, by the border of the territory of Ljubjana - *Emona*, as suggested by a recently found boundary stones that marks the limits between the *ager* of Aquileia and that of *Emona*, nevertheless indicating that they were part of the same administrative unit[25].

[22] See STRAZZULLA RUSCONI, ZACCARIA 1984, p. 115 and mentioned bibliography.
[23] DE FRANCESCHINI 1998, p. 66.
[24] *N.H. III*, 18, 126-132.
[25] See MONDIN 2011, p. 133 and mentioned bibliography.

The decision to consider also the territory in the nowadays Western Slovenia as part of the *Regio X* has been supported by different reasons.
An evidence in this sense is the above-mentioned boundary stone, indicating the *limes* between Aquileia and *Emona* territories. Epigraphic and archaeological consideration date it to the 1st century AD[26], a chronology compatible to the one suggested for the archaeological site *Stella 1*. Thus it is likely that the territories of nowadays Western Slovenia were already part of the *Regio X* when the archaeological deposit under investigation was created.
Comparisons among sites in *Emona* territory disclosed a wide homogeneity with the materials analysed in the present work, thus confirming the consistency of the decision.
In the 1st century AD Romans were gradually expanding in the North Eastern Adriatic, founding several colonies; pottery and building materials manufactured within the *Stella* basin found their way to the settlements on the Eastern shores of the Adriatic Sea and their hinterland[27].
Furthermore, trades between the two areas increased from the end of the 1st century BC by the opening of the *Via Gemina*, directly linking Aquileia with *Emona*. The presence of this big consular road fostered the creation of several settlements along its path, where materials produced within the territory of Aquileia were easily transported and traded.
Since the contexts had suggested a circulation of *Stella* basin products also on long-distance, the review of published contexts was finally enlarged to cover Northern Italy in its total extension and beyond.
Attention has been focused on sites located along the main consular roads (*Via Annia*, *via Postumia*, *Via Aemilia*) and along the river Po. Recent research[28] and archaeological evidence suggested a circulation of goods and people along a route that, linking Torino - *Augusta Taurinorum* with Ljublljana - *Emona*, had in Aquileia a central place, for the position of the city at the convergence of terrestrial roads and waterways.

[26] ŠAŠEL KOS 2002, c. 246.
[27] See chapter 2.2, p. 22.
[28] See GABUCCI 2017 about the circulation of Gaulish *Samian ware* in Northern Italy.

A telling proof of the commercial links that crossed the entire Northern Italian territories is the inscribed funerary stele of the merchant *L(ucius) Tettienus Vitalis*, recently recomposed by two fragments collected in Turin. The merchant, speaking in first person, said that he was born in Aquileia and then he moved to *Emona*; at the end of his life, he retired in *Augusta Taurinorum.* The three cities of his life represent three central places of a major commercial routes that, exploiting also the rivers Sava and Po, linked the Eastern territories of the Empire and the Balkan area to Northern Italy and the Cisalpine[29].

Looking at very distant sites, similarities have been searched focusing not on single features of the vases, but taking into consideration the totality of their characteristics. Materials from different sites were compared looking not only at morphology, but also at fabric and dimensions. Indeed, similarities in morphology, especially when confined only to the rim shape, could be produced by chance[30], while the purposes of the present research is to identify connections between different sites, proved by the presence of the same containers, either arrived by trade from the production centres or locally adapted.

From a chronological point of view sites whose chronology ranges from 1st century BC to 2nd century AD were preferred for such a comparative research.

However, also materials collected during past excavations and/or during fieldwalking surveys, although sometimes lacking of any stratigraphic information, have been considered here. Indeed, this research is focused mainly on spotting similarities than defining the chronology of the *Stella 1* finds.

Following these *criteria* several distribution maps for the materials found in the *Stella 1* site were plotted[31]. They drive conclusions about production and exchange patterns of coarse ware in a wide and supra-regional territory.

[29] The funerary stele has been recently published and commented in GABUCCI, MENNELLA 2003.

[30] SANTORO BIANCHI 1990, p. 394.

[31] See *Appendix II. Distribution maps*, pp. xlv-liii.

5.3 Basics of the catalogue

Each coarse ware individual collected on the *Stella 1* site has been described filling a custom-made Excel spreadsheet, whose entries enabled to record in a systematic way information of different kind and nature, encompassing both excavation *data* (i.e. position within the area of scattered artefacts) and inner features of the piece (dimensions, production technology, usage marks, *etc.*). Entries have been selected in order to make the spreadsheet useful for both study and analysis purposes, and they thus encompass field related both to the available documentation (drawing, pictures) and to the results of the study (chronology and available bibliography).
The Excel spreadsheet comprehends therefore the following twenty-two entries:
- *catalogue number*: the progressive number given to each vase, after the identification of the minimum number of vessels;
- *quantity of fragment*: number of fragments that compose the vase or the piece;
- *inventory number*: preceded by the acronym AP, that stands for *Anaxum Project*, is the number assigned to each fragment during the excavation. In case of vases recomposed from matching pieces, the inventory number of each of them is listed;
- *description*: a brief textual description of the main features of each fragment/vessel. In order to be as consistent as possible and to make it easier the search for common elements, a restricted vocabulary was selected. To facilitate the comparison with artefacts unearthed in different sites of the *Regio X*, the nomenclature *criteria* proposed in 1998 at the International congress of Lido di Camaiore for North-Eastern Italian pottery from Prehistory to Late Republican age have been adopted[32];
- *provenance*: position of each fragment within the area of scattered artefacts, mentioning the alpha-numeric identification of the provenance square(s);

[32] MIZZAN *et Alii* 1999, pp. 309-311.

- *rim diameter*: specifying whether it was real or reconstructed from fragment(s). Expressed in centimetres;
- *bottom diameter*: specifying whether it was real or reconstructed from fragment(s). Expressed in centimetres;
- *maximum height*: for the fragments, measured taking into account the real inclination. Expressed in centimetres;
- *maximum length*: only for fragments. Expressed in centimetres;
- *thickness*: measured at the point of maximum extension. Expressed in centimetres;
- *fabric*: short description of the fabric, following the parameters presented above;
- *traces of fire exposure*: possible presence of burnished and/or carbon coated areas that could suggest the use of the vase on the fire;
- *usage marks*: possible traces that could be interpreted as an hint of the vase function and use (i.e. the presence of some organic residues, traces on the rim and/or the neck that could suggest whether the vase has been sealed or not and how, *etc.*);
- *production techniques*: description of traces resulting from the manufacturing techniques (hand-made, wheel-thrown, combination of both);
- *finishing technique*: traces of finishing techniques such as scraping, trimming, smoothing, burnishing, *etc.*;
- *decoration*: description of the decoration, when it is present. Indication of the type (incised or impressed), the part of the vessel interested by, the main decorative patterns;
- *notes*: possible features that were not described in the previous fields;
- *drawing*: when the piece was drawn, number of figure and plate;
- *picture*: number of pictures representing each piece (all the fragments were photographed);
- *form*: indication of the functional form (*olla*, lid, beaker, pan, bowl, platter or simply base);
- *type and variant*: alpha-numerical identification of type and variant according to the morpho-typological classification developed for the *Stella 1* materials;
- *comparisons*: main comparative materials indicated through references to the main publications;

- *chronology*: chronological assessment provided by the comparison with dated published materials.

Data collected through the spreadsheet provide information for the compilation of the annotated catalogue presented in the next chapter.

The catalogue is divided in paragraphs, each one devoted to a specific form; the presentation order follows the percentage with which each form is attested within the pottery assemblage.

The first paragraph is therefore devoted to the *ollae*, the most attested vases; the following paragraphs are dedicated, in order, to lids, beakers, pan, bowls and platter. A separate paragraph presents all the bases that were not recognised as belonging to a specific form. The catalogue ends with the presentation of the *varia*.

Each paragraph opens with a detailed description of each type, highlighting its significant and distinctive features; possible variants are then presented, underlining their specific attributes. In the case of the *ollae*, a subparagraph has been created for each of the ten types identified.

Comparisons with previously published materials enabled to define the range of distribution and to asses a plausible chronology for the majority of the type identified. The results of this kind of research will be provided in the opening paragraph devoted to each type.

At this point, it has to be noticed that the search of comparisons was made taking into consideration only the main characteristics of each group, without further dividing similar materials according to the identified variants. Indeed previously published reports and catalogues are very different from each other and not all of them list and stress the same features, even the one considered fundamental to distinguish a peculiar variant inside a type in the present work. For this reason, geographical and chronological consideration were made and are presented at the type-level.

Essential for the understanding of the information regarding the geographical distribution and the chronological assessment are some materials presented in the appendices.

A list of all the comparable archaeological findings, used to trace the geographical distribution of each type, is summarised in *Appendix I. Tables of comparisons*, comprehending several tables, one for each of the

most meaningful type. *Data* gathered here were used to create the distribution maps presented in the following *Appendix II. Distribution maps*.
In a similar way, chronology of each type has been proposed started from the chronological data provided by materials unearthed in stratigraphically excavated contexts; also this kind of data have been summarised in tables, collected in *Appendix III. Tables of chronologies*.
Having collected the documentation in these easily consulted tables and maps, in the next chapter only resulting data are going to be presented.
After this general exposition about the type, *Stella 1* materials belonging to each type are going to be further analysed.
Some space will be given to numerical consideration, regarding pottery dimension and capacity; in some case this kind of analysis provided some useful insights in detecting the existence of some pottery series, leading to the identification of potential services. These information were further used to shed light on the function of each type, thus providing the possibility to understand their presence in the ceramic assemblage.
Each paragraph ends with some catalogue cards, presenting the most meaningful pieces, the ones used in order to develop the morpho-typological classification. They are presented and described in details, using a tailored catalogue card.
Since the information collected in the spreadsheet are numerous and some of them will not be useful to the reader, the catalogue card do not contain all the spreadsheet entries, but only some of them, following the model reproduced below:

Catalogue number	Preceded by the letter *V* - that stands for *vase* - it is a progressive number that identifies each individual.
Inventory number	Inventory number given to each piece immediately after the excavation.
Graphic/Photographic Documentation	Roman numeral of the table; number of the picture/drawing.
Provenance	Alphanumeric code identifying the square where each fragment has been collected. In case of vases reconstructed from fragments collected in different squares, all of them are listed. In some case, a graphic representation of the provenance of each fragment is provided.
Description	Brief morphological description of each individual.
Decoration (not mandatory fiedl)	Brief description of the potential decoration, listing the position, the decorative technique and the motif(s).
Dimension	Rim diameter: Bottom diameter: Maximum height: Maximum thickness:
Production techniques	Hand-made or Wheel-thrown; traces used to infer it.
Usage marks	Every kind of traces that hints for the vase functional destination (fire marks, use-ware, organic residues, *etc.*).

Information provided in the catalogue are completed by the graphic documentation, reproduced in the plates collected in *Appendix IV. Plates*
The first plates contain photographic reproductions of the most meaningful pieces; then plates containing the graphic representations of selected shards/vases have been inserted.
Each plate is identified by a Roman numeral; photographic plates go from I to VIII while plates of drawings, go from I to XXX. An Arabic number, also reported in the catalogue card, flanks each image or drawing in each table. Both the catalogue and the inventory numbers are noted in the legend at the foot of each table.
Every single picture and every single drawing has its own metric reference; however, if not differently specified, drawing are in scale 1:4.

The morpho-typological classification and the relationships among the materials (not only among pieces belonging to different types but also among vases with diverse features and dimensions being part of the same group) provide *data* to develop hypothesis on the area of scattered artefacts, leading to a first interpretation of the nature and formation of the archaeological deposit.
On the other side, the search for comparison and the analysis of distribution of the identified forms in the *Regio X* and beyond, was the first step to reconstruct the pattern of production and distribution of coarse ware in the North-Eastern side of the Roman Empire.
Observations and information resulting from the analysed pieces are going to be presented and further discussed in chapter 7.

Chapter 6

Stella 1 coarse ware

6.1 *Ollae*

The name *olla,* directly taken from Latin literary sources, was chosen to identify a close vase, with globular/oval body, an open mouth with a rim diameter greater than 10 centimetres and a flat base. The vase height is always greater than the maximum girth.
Among *Stella 1* coarse ware, 229 *ollae* were identified, comprehending both completely preserved and fragmentary vases.
According to their rim diameter, *ollae* have been subdivided in:
Small *ollae*: ø < 15 cm
Medium *ollae*: 15 cm < ø < 20 cm
Large *ollae*: ø > 20 cm.
Morphological characteristics led to the identification of 9 different types, some of them further subdivided into variants. A tenth group, labelled as *varia*, collects fragments too small for unequivocal classification as well as a number of fragments whose poor preservation state prevent to insert them in the previously identified groups.
Each type is briefly presented from a morphological, technological and functional point of view; possible variants are then introduced.

Next come distribution and chronology, both embedded in references taken from a generously defined region. Furthermore, numerical considerations (numerical attestation of each variant, dimensional parameters, carrying capacity, *etc.*), enabled to detect the presence of some services, and thus to shed light on the reasons of the presence of each type of vase in the *Stella 1* ceramic assemblage.
Each paragraph ends with the detailed description of significant pieces and fragments, used for the definition of the morpho-typological group, provided through the catalogue card presented in the previous chapter. A list of non diagnostic sherds attached at the end of each shape completes the presentation.

6.1.1 *Ollae 1/Trieste Antica 7-9*

This type groups a large number of *ollae* characterised by a medium-large flat base, a globular/ovoid body and an everted rim. *Ollae 1* distinctive feature is the accentuated shoulder, sharply separated from the neck. Frequently the passage neck-shoulder is marked by a groove (see *figure 1*).

Fig. 1 Stella 1, Ollae 1.
Drawing and picture of an almost entirely reconstructed sample

The shoulder is further characterised by a decoration, mainly consisting of a bundle of incised lines. The most common pattern is constituted by parallel, horizontal lines, in variable number; waving lines are less frequent, while other decorations, sometimes made through different techniques, are quite rare.
Rims are usually everted, but they are slightly different from each other. They can be flattened, rounded, or slightly thickened. On top of some rims, a groove could host and hold the lid.
These minor differences in the rim profile cannot be considered discriminating features, sufficient to divide the main type in morphological variants. In an artisanal production, they do not necessarily mirror deliberate choices made by ancient potters. Furthermore, comparisons with published materials clearly shows that these minor variations in the rim shape do not have any chronological meaning.
Sound differences in the pottery fabric, visible through simple macroscopic observation, have led to the identification of three variants within *ollae 1* (see *figure 2*).

Fig. 2. Stella 1, Ollae 1. *The three variants*

Ollae 1a are characterised by an almost depurated pottery fabric, with very fine, sparse and well sorted inclusions, mainly consisting in glistering flakes of mica and tiny rock fragments. The surface appears smoothed, with quite regular freshly broken sections. The average maximum wall thickness is 0.9 centimetres.

Vases were usually wheel-thrown, as suggested by the regular thickness of the walls and by the common presence of medium and small size sand grains on the underside of the base. A further proof of the manufacturing on the wheel is the high frequency of wheel thrown marks, especially on the inner surface. External surfaces were subsequently smoothed; another distinguished feature of *ollae 1a* is the presence of brushstrokes marks, resulting from the smoothing of the surface, performed with wooden sticks (so called *lisciatura a stecca*). These marks start immediately under the decorated shoulder and they are visible on the entire body.

Colours are always light, ranging from creamy, to beige, to pale orange, suggesting a firing in oxidising conditions; however burnt marks are quite frequent, and spots of different colour could be observed on several vases, testifying for uneven firing conditions.

Rims could have different shapes; a bundle of horizontal incised lines is the most common decoration, but other patterns are attested.

Ollae 1b are characterised by a rough fabric, with medium and coarse inclusions, quite frequent but ill sorted. In some pots, inclusions granulometry and their angular shapes suggest that they have been added intentionally to the clay, as temper.

The pottery surface appears harsh when rubbed with the thumb. Freshly broken sections are irregular and sometimes hackly. Wall thickness measures, on average, 0.8 centimetres.

Almost all the vases are wheel-thrown but the majority of them did not undergone finishing, smoothing or any other surface treatments. However, on some vases, faint traces of smoothing with a wooden stick could be spotted on the outer surface.

The colour ranges from light orange to black; this heterogeneity, sometimes even within different portions of the same vase, testifies that these pots were irregularly fired, through an uneven alternation of incomplete oxidizing and reducing phases.

Rims could have different shapes; a bundle of horizontal parallel lines incised with a comb is the most common decoration, but at least on one vase another pattern is attested.

The last variant, ***ollae 1c***, gathers only a small number of vases, whose distinctive features though force the creation of a separated group.

Ollae 1c are characterised by an almost depurated fabric, with medium and mostly fine inclusions, sparse and well sorted. They consist mainly of black and white small flakes of glistering mica. Fine white quartz grains are visible.
The surface appears quite smoothed when rubbed with the thumb and freshly broken fractures are sharp and usually regular. Wall thickness is thin and regular; average measure is 0.7 centimetres (but rim are usually thickened, increasing the average). All the vases are wheel-thrown and the regular disposition of inclusions suggest that they were carefully smoothed and finished.
The colour is grey-dark grey, suggesting a reducing firing atmosphere; however, some portions, even on the same vase, are characterised by an orange coloration, testifying uneven firing and/or cooling conditions.
Rims are usually out-slanting, but they vary within the group; so far only the bundle of few horizontal combed lines is attested as decoration.
Browsing bibliography when looking for comparisons, it has been decided to take into consideration only archaeological findings that without any doubt shared the main feature of the type, i.e. the prominent, decorated shoulder, sharply separated from the neck. It means that tiniest fragments, although previously mentioned in the dedicated literature, were not considered, since their bad preservation state hinder the possibility of an unquestionable identification.
Ollae 1 are very common in *Regio X*[1]; in the northern necropolis of Ljubljana-*Emona*, that constitutes the most Eastern attestation for these pots within the regional borders, vases that share the same morphological and technological characteristics are attested also in the reduced size of the beaker[2].

[1] A list of the sites, both in *Regio X* and beyond, that brought back materials comparable to *ollae 1* is provided in *Appendix I*, Table 1: *Ollae 1*, pp. ii-xv.

[2] In Ljubljana - *Emona* this kind of *ollae* are attested both in the necropolis and in settlement strata, confirming the twofold use of this vase, as household objects as well as funerary items. *Ollae 1* are attested in gray-brown fabric, always with brush ornamentation (PLEŠNICAR-GEC 1977, p. 80 and p. 107, Tav. 4, 4-6) while beakers are realised in an almost depurated fabric. For a list of the comparable vases collected in the Northern necropolis of *Emona*, see *Appendix I*, Table 1: *Ollae 1*, pp. iv-v.

Ollae 1 distribution map suggests that they are spread in a wide area, comprehending more or less the entire Northern Italy, i.e. *Regiones X, XI, IX* and *VII.* Few samples are attested outside Italy borders.
The Apennines seem to constitute the Southern border for the diffusion of the type[3], while *via Aemilia* and *via Postumia*, as well as the river Po, should have worked as preferential routes for the diffusion of the type.
Materials unearthed in stratigraphically excavated contexts suggest that this kind of vase remained in use for a very long period, from the Augustan age to the 4th century AD[4]; however, it is possible to trace an evolution within this long time span.
First samples appeared at the end of the 1st century BC[5], leading some scholars to consider this kind of vase a production typical of the *Romanization* period; the shape of the *olla* follows a Roman model, while the very simple decorative pattern, located at the maximum girth of the vase, found its origin in the local Celtic legacy, commonly spread in the entire diffusion area[6].
The majority of samples is dated to the 1st - 2nd century AD, when the type reached its maximum spread, being one of the most common shape all over Northern Italy[7].

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[3] However *ollae* with the same features were used as cinerary urns in the necropolis of Porto Recanati, in *Regio V*, nowadays Abruzzo (CAPITANIO 1974, *passim*). On the other side of the Adriatic, the southern presence is attested in the Roman military camp of Ivoševci - *Burnum* (See BORZIĆ 2014, p. 190, Tav. 1,15 e 1,30).

[4] A list of chronologies of comparative materials is provided in *Appendix III*, Table 1, *Ollae 1*: Chronology, pp. lv-lvii.

[5] Some samples were unearthed in layers dated at the beginning of the 1st BC, but they are likely intrusive materials. A beginning of the type in the Augustan age was considered common knowledge already in the nineteen nineties, thanks to the numerous materials unearthed in Northern Italian necropolis (see, for example, *Scavi MM3*, p. 186).

[6] See CORTI, TARPINI 1997, p. 122: "*Si tratta di una forma ampiamente diffusa in area lombarda tra l'età della romanizzazione e la primissima età imperiale, e che trova i suoi antecedenti nelle olle celtiche con decorazione incisa. Anche il tipo di decorazione, come quello delle olle ad orlo sagomato alle quali si trovano spesso associate, ripropone motivi di tradizione preromana*" and BRECCIAROLI TABORELLI 1998, p. 72: "*Olle a labbro estroflesso, di dimensioni assai variabili, che talvolta mostrano l'applicazione, su un modello formale "romano"di tecniche e motivi decorativi tradizionali locali*".

[7] See GIOVANNINI, MANDRUZZATO, MEZZI, PASINI, VENTURA 1998, c. 306.: "*Questo tipo di contenitore, (…) è largamente diffuso in tutta l'Italia settentrionale dall'età della romanizzazione fino a tutta l' Età Imperiale ma riscuote particolare favore nei primi due secoli d.C.*".

Few samples have been unearthed in layers dated to the 3rd - 4th century AD; however in these late centuries the number of *ollae 1* generally decreased. At least in some cases, it is likely that these fragments are residual materials from more ancient layers.
Taking into consideration the chronology provided by other materials collected at the *Stella 1* site[8], a dating to the 1st - 2nd century AD seems to be likely for *Stella 1 ollae 1*, without any further possibility to shrink the time span.
It is clear that *Ollae 1* were quite common in settlements, where they should have been used with different purposes. Morphological and technological features make these *olla* suitable for both cooking and storing. The coarse fabric and their heavy structure enable them to resist thermal shocks and repeated exposition to fire with subsequent cooling; the flat base and the wide mouth make them functional to store small quantity of food that needs to be easily accessible, for example for everyday use. In all the examined contexts, and within *Stella 1* materials, both functions are testified. Some vases bear scattered burnt marks and/or present sooted areas, while some others lack any kind of traces resulting from the use over the fire.
Ollae 1 are well attested, especially in *Regio X*, in necropolis and isolated graves. They were mainly used as cinerary urns[9], but sometimes they were offered as grave goods. In few cases sherds found scattered all around the graves have been interpreted as remainings of funerary banquets, thus testifying another time the functional destination of this kind of vase for preparing and temporary storing foods, in this case for religious/ritual purposes[10].
Samples unearthed in graves sometimes bear burnt marks and/or are characterised by other usage marks, suggesting that *ollae* used as cinerary urns were everyday use vases, then employed in a different

[8] For a general overview of the chronology of *Stella 1* materials, see chapter 3.9, pp. 60-68.
[9] It is the reason why in some publications they are still named as *urne*.
[10] The necropolis of *Biella*, in nowadays Piedmont, bears witness of all the three uses. Several *ollae* of this kind were used as cinerary urns; some graves contained however multiple samples, usually in smaller dimensions, interpreted as grave goods. Some vases unearthed outside the graves, both intentionally broken and entirely preserved point finally to an use during funerary banquets; they were then buried with the deceased. PREACCO ANCONA 2000, p. 112.

context[11]. So far no production specific for the funerary destination has been ascertain.

Within the area of scattered artefacts of the *Stella 1* site, 54 *ollae 1* have been identified. The most frequent variant is *1a*, that gathers shoulder-prominent *ollae* in almost depurated fabric. *Ollae 1b* are a consistent group, while *ollae 1c* are attested by only three fragments (see the graph in *figure 3*).

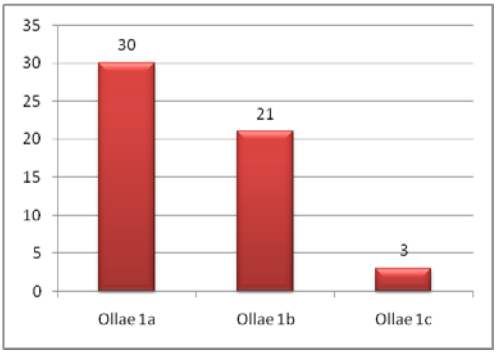

Fig. 3. Stella 1, Ollae 1. *Distribution of variants*

It has to be acknowledged that this higher percentage of *ollae 1a* within the type could be the result of a bias due to the peculiar technological characteristics of the variant itself.

The finer *ollae 1a* fabric is completely different from all the other fabrics attested within *Stella 1* materials; also the brush strokes marks left on the lower external surface by the finishing technique are easily detectable, and peculiar of this variant.

These features enabled to recognize as belonging to *ollae 1a* a number of some non-diagnostic fragments: several flat bases have been inserted in *ollae 1a* list as well as some otherwise non identifiable body sherds.

Wheel-thrown *ollae* in almost depurated fabric, characterised by brush strokes on the external surface are quite common in the *Regio X*[12] and in

[11] Sooted area and burnt marks visible on the surface of *ollae* unearthed in graves and necropolis could not be compatible with traces left by an exposition over the fire during funerary ceremonies for different reasons. Indeed *ollae* were used mainly as cinerary urns, to collect and preserve the remaining of the cremation, and were not burnt over the *pira* as other kind of grave goods (for example, the glass *balsamaria*, frequently found melted in funerary contexts). Furthermore, the position of burnt marks and sooted area, that in the majority of cases could be seen also on the interior surface of the vases, confirm that they are compatible with the use of the *ollae*, both over the fire or among hot ashes, for cooking reasons, when the vases were full of content that needed to be heated and that left its traces on the pots inner walls.

[12] Just to mention some examples, should be recalled here some *ollae* unearthed in the *Beligna* necropolis in Aquileia (GIOVANNINI, MANDRUZZATO, MASELLI SCOTTI,

several other Northern Italian sites; in each of them the fabric peculiarities presented above make this variant completely different from other vessels, usually locally produced with different raw materials.

Publications dealing with pottery frequently give only very concise fabric descriptions; however in several contexts *ollae* comparable to variant *1a* were found together with pots formally similar but made in a coarser fabric.

Within *Regio X*, it is the case of the *ollae* unearthed at the *villa rustica* of Joannis (UD), realised in two different fabrics: a coarser one, dark in colour and with frequent inclusions in quartz and mica, a description matching *ollae 1b* features, and a finer one, almost depurated, orange in colour, comparable with *ollae 1a* features[13].

In Padova, *ollae* of this kind appeared to be characterised either by a coarse fabric, rich in inclusion, or by an almost depurated one, light in colour[14].

Outside of the *Regio X*, the coexistence of two fabrics is testified by the *ollae* unearthed in the necropolis of Cerrione, in the municipality of Biella, nowadays Piedmont; some of them are characterised by an almost depurated fabric, fired in oxidising conditions, while some others were made with a coarser fabric, richer in inclusions and impurities[15].

The same situation is also detectable in the Oleggio necropolis, where *ollae 1*, used both as cinerary urns or grave goods, were realised in two different fabric, one darker and coarser and the other lighter and finer[16]. Within the *ollae* unearthed in the necropolis of Biella, two fabric variants have been recognised: one is coarser, brownish/black, with

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MEZZI, VENTURA 1997, passim); *ollae* brought to light during the excavation in via Crosada, in Trieste (*Trieste Antica*, p. 109); some *ollae* from the pottery waste in via Retratto, Adria (DE MIN, BONOMI *et Alii* 1986, p.220); *ollae* recovered in the rural settlement of Chiunsano (CORTI 2016, p. 102); same samples from Musile di Piave (CROCE DA VILLA, FAVERO *et Alii* 1990, p. 180) and some *ollae* collected at Ro Ferrarese (CORTI 2018, p. 208).

[13] For a detailed fabric description, see STRAZZULLA RUSCONI 1979, c. 69.

[14] See MAZZOCCHIN *et Alii* 2006, p. 38.

[15] See BRECCIAROLI TABORELLI, DEODATO 2011, p. 132.

[16] See POLETTI ECCLESIA 1999, p. 312.

large and medium size inclusions, the other is lighter in colour (beige/orange) and is characterised by fine sandy and micaceous inclusions[17].

Ollae 1a are particularly frequent in North-Western Italian sites; current opinion sees them produced in different regional workshops located within the area of nowadays Piedmont. The recurrent fabric characteristics, as well as the distribution that follows the principal terrestrial and fluvial routes, widely support this hypothesis[18].

The wide distribution could be correlated with the high quality of these productions, that made them particularly resistant and suitable for cooking; however it seems more plausible that they circulated as transport containers for perishable goods. Signs, mostly numbers, incised on the shoulder can be observed on pots unearthed in different sites all around the distribution area and beyond[19]; it is likely that they refer to the content of the *ollae*, suggesting their main function as transport containers for food.

Evidences provided by *ollae 1* collected at the *Stella 1* site support this interpretation.

Their relative high number is a sign that they were not part of the board equipment; a fluvial barge like *Stella 1* one did not need such a large quantity of utilitarian vessels.

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[17] See PREACCO ANCONA 2002, p. 113.

[18] CORTI 2018, p. 208.

[19] The numeral XII is incised on the shoulder of two vases unearthed in Chiunsano and Ro Ferrarese (CORTI 2018, p. 208, fig. 1.9) and on a cinerary urns from the necropolis of Biella (PREACCO ANCONA 2000, p. 115, fig. 117 a, b, c).

The number seems not to be related with the capacity of the vase, since it appears on *ollae* of different sizes and dimensions. However the Biella necropolis also brought to light some vases with a reverted "S" sign incised on the same position; it has been argued that in this case the sign stands for *semis*, the weight unit equivalent to half an *ounce*; in this latter case, the numeral sign should indicate the capacity of the vase, since it is compatible with the recurrent measure of the *ollae* characterised by this sign.

Confirming the homogeneity of the type, despite its wide diffusion area, numerical signs are particularly frequent in Roman sites of Slovenia (just to quote one examples, it is worthy to mention one *olla* unearthed in the *Emona* necropolis bearing on the shoulder a numerical incised sign. See PLEŠNICAR-GEC 1972, tav. CXLI, t. 615, n. 12 = PLEŠNICAR-GEC 1977, Tav. 4, 6).

Furthermore, some dimensional relationships observed within the samples belonging to the type bolster the idea that this kind of *ollae* were used as food containers.

Ollae 1 diameters, both entirely preserved and reconstructed from fragments, confirm that small, medium and large *ollae* are attested within the type; small *ollae* are the majority (see the graph in *figure 4*).

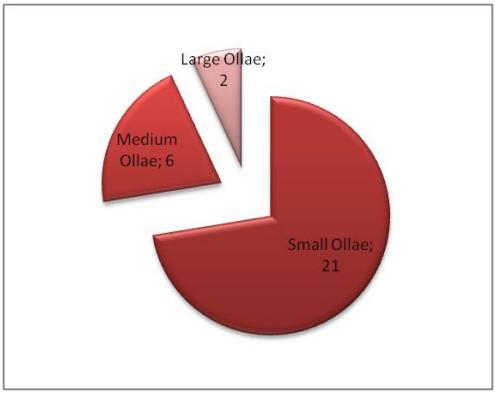


Fig. 4. Stella 1, Ollae 1, *sizes*

The carrying capacity has been calculated on a sufficient number of entirely preserved or archaeologically reconstructed samples.

The program *Archeo 4*[20], used to performed the calculation, provided the capacity in Litres. It is however highly probable that *ollae* were used to transport small quantities of dry food[21]; the value was then converted in the Roman dry weight unit, the *sextarius*, using the equivalence 1 *sextarius* = 0.546 Litres.

The *sextarius* was preferred over the most commonly known *librae* because the two weight unit served for two different purposed.

As testified by *tituli picti* and *graffiti* attested on amphorae found all over the Mediterranean shores, *librae* were used for major quantities of goods, within the framework of what can be defined a wholesale commerce. *Sextarius* was instead the weight unit for retail commerce.

A telling proof of this distinction comes from the sign of the so-called *Ad cucumas* winery shop in Ercolano. Four pitchers, each one

[20] The program, developed by Jean-François Meffre and Yves Rigoir from the *Laboratoire d'Archéologie Médiévale et Moderne en Méditerranée* from the *Université d'Aix-Marseille*, is open source and can be downloaded at http://la3m.cnrs.fr/pages/outils/ceramologie/archeo4/archeo4.php (last access: 07/02/2019).

[21] Liquid foods, especially oil and wine, were usually carried in amphorae (and at *Stella 1* site several amphorae have been collected through the years) or, as stated by literary sources, in wood barrels or other perishable containers.

containing a different variety of wine, are depicted on the sign, each one with an indication of the price for a small quantity of wine, expressed in *sextarii*[22].

That *librae* and *sextarii* were both used for the same kind of foods, but for different kind of commercial transaction, is further proved by *lex Silia*, that contained a first attempt to regulate the conversion between the two measures, already in the 3rd century BC[23].

In order to retrieve more consistent results, capacity in *heminae* were calculated, using the equivalence 1 *sextarius* = 2 *heminae*[24]. Results of these calculations are summarised in the table below, where the differences in colours underlines the different values for small, medium and large *ollae* (see *table 1*).

Olla	**Diam. cm**	**Height cm**	**Capacity Litre**	**Capacity *Sextarius***	**Capacity *Heminae***
V31/AP994+ AP1003+AP1050[25]	12	14,4	1,52	2,78	5,57
V1/AP682+AP732+ AP810+AP917	13,2	16,8	2,84	5,25	10,51
V2/AP234+AP461+ AP508	13,6	16,8	2,44	4,59	9,18
V32/AP276+AP423 +AP476	14	16,9	2,50	4,63	9,27
V33/AP311+AP631 +AP1245	14	17,2	2,27	4,20	8,40
V41/AP1088	13,2	17	2,6	4,94	9,88
V3/AP47+AP48+ AP174+AP259+ AP320	15,6	19,2	3,44	6,37	12,74

Table 1. Ollae 1, *sizes and capacity*

[22] See CORTI 2016b, p. 160 and mentioned bibliography.

[23] FEST, s.v. *Publica pondera*, 288, 31-36.

[24] For both the equivalences the values provided by O.A.W. Dilke in the nineteen eighties, still widely accepted by scholars, were adopted. See DILKE 1987, p. 27.

[25] Each vase is identified by both its progressive number in the catalogue, preceded by the letter V, and by the inventory number assigned at the moment of the recovery to each fragment it is composed of. See chapter 5.3, pp. 136-141.

Small size *ollae* are the most frequent; their dimensions are quite homogeneous, despite some minor variations due to the artisanal production and to the low standardization. On average, small size *ollae* diameters measure +/- 14 centimetres and their height is around 17 centimetres, with an average carrying capacity of 4,5 *sextarii*, i.e. 9 *heminae*. The only entirely preserved medium size *olla* yields 6 *sextarii*, i.e. 12 *heminae*. On average, we face thus this situation:
Small *ollae*: 4,5 *sextarii* = 9 *heminae*
Medium *ollae*: 6 *sextarii* = 12 *heminae*
It means that medium size *ollae* carrying capacity is equal to small size *ollae* carrying capacity multiplied for a factor of 1,33.
One pot is even smaller. With only 12 cm diameter and 14,4 cm height V31/AP994+AP1003+AP1050 is almost a beaker, yielding 2,76 sextarii = 5,57 *heminae.* Rounding up this value, this smaller *olla* has a carrying capacity of 3 *sextarii* = 6 *heminae*.
Sizes and carrying capacity are summarised in the following table (see *table 2*):

Ollae	**Carrying capacity / L**	**Carrying capacity / *sext.***	**Carrying capacity / *hem.***
Smallest (V31)	1,52	3	6
Small (average)	2,45	4,5	9
Medium (V3)	3,44	6	12

Table 2. Ollae 1, *average capacities per sizes*

A progression based on the multiplying factor 1,33 results thus clear, confirming a modularity in moving from one size to the other (see *figure 5*).

Fig. 5. Stella 1, Ollae 1. *The three modular sizes*

This clear dimensional relationship is an indication for a specific content traded in different quantities, however modular and constant. Black, presumably organic traces of this content are visible on an irregular pattern, further suggesting that at least some of these vases were full at the moment of the wreck.
All these evidences, combined with the relatively high number of *ollae 1* within the analysed assemblage, foster the interpretation that *ollae 1* collected at the *Stella 1* site were part of the boat cargo.
Furthermore, ceramics of the *Stella 1* site indicate that *ollae* with prominent, decorated shoulder circulated as food containers, fostering an idea already proposed on the basis of the wide diffusion of the type along the main terrestrial and fluvial routes and of the presence of numerical signs on same samples, that, given these circumstances, should be interpreted as indication linked to the content.
The relationship between morphological features and content is evident in Roman potteries, not only amphorae. The association between a peculiar vase form and a specific food has been recently established within coarse ware, for a variant of *Auerberg* pot produced in *Regio X*. Gaschromatographic analysis on the content proved the trade of goat and sheep meat preserved in fat, highlighting a relationship between morpho-technological characteristics and content[26].
The relationship form-function-content is not univocal; as already mentioned, after a first use as container, these *ollae* could have been re-used as cooking or storage vessels, since their technological characteristics made them suitable for both uses. A final re-use as cinerary urns was quite common, as testified by samples unearthed in several necropolis all around Northern Italy.
In *Stella 1* materials this modularity concerns both variants *1a* and *1b*[27], proving that, despite the obvious fabric differences, *ollae 1* share a common function. Morphological features and sizes remain unchanged

[26] This use of *Auerberg* pot is going to be analysed in detail in the next pages (see chapter 6.1.9, pp. 289-300). For a comprehensive overview of the study, see DONAT, MAGGI *et Alii* 2007.
[27]Nothing could be said about *ollae 1c* since no sample was entirely preserved, thus hindering the possibility to retrieve information about the carrying capacity of this *ollae*.

across the variants; it is likely that these *ollae* were associated to a specific food. The shape itself should have worked as a hint for the content.

Ollae 1 share a common form and function: therefore, the three different variants observed, *ollae 1a, 1b* and *1c*, need an explanation beyond the functional one. Provenience could play a role and thus the three variants testify different kind of productions.

Ollae 1a could be imports from North-Western Italy; a production in nowadays Piedmont has been proposed for comparable materials discovered in the area of Modena, where they were supposed to be traded along the *via Postumia* and in all probability shipped on the river Po[28].

The area of Modena is well connected with the *Regio X* lower plain through terrestrial roads (especially the *via Annia)* and watery routes, that exploit the series of lagoon and inner rivers.

Ollae produced in North-Western Italy could have arrived in the *Stella* basin, crossed by the *Via Annia* and well connected with the lagoon thanks to rivers, as the *Stella*/*Anaxum* itself, and artificial canals.

A further proof of this interpretation could be considered the almost simultaneous appearance of *ollae 1a* in both territories at the beginning of the 1st century AD, when the presence of Romans was well established and when the communication network of terrestrial and watery routes was in full work.

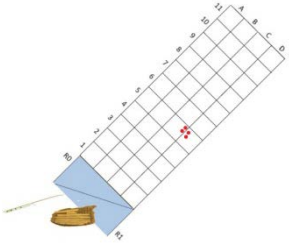
Ollae 1a could be considered an import. On the other side, *ollae 1b*, characterised by a coarser fabric more similar to local pottery, are likely a local production, that preserved the characteristics of the foreign model, without considerable morphological and dimensional variations. Nevertheless, the possibility that migrating potters replicated a widespread model, using local raw materials and simpler production technologies (the majority of *ollae 1b* do not preserve traces of finishing treatments) cannot be excluded.

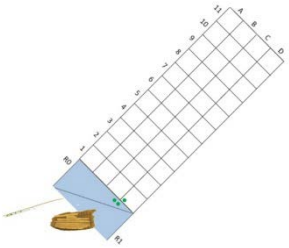
The probable relationship between this peculiar shape and a specific contents can be an indication for local availability of the initial content. These groceries would be traded in a well-known container, whose

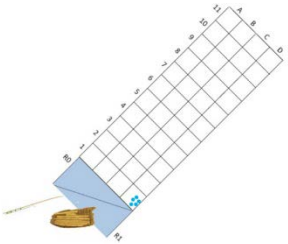
[28] CORTI 2018, p. 208.

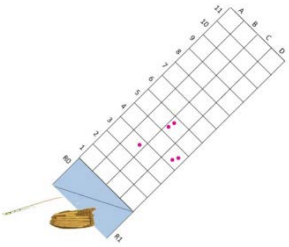
shape soon became the marker for the foodstuff content. It is also probable that the content itself started to be produced locally.
A different interpretation has to be proposed for *ollae 1c*; precise comparisons are dated later, in the 3rd -4th century AD. The three samples collected at the *Stella 1* site therefore represent intrusive materials, as also their lower frequency seems to suggest.

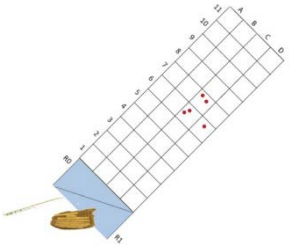
Ollae 1a

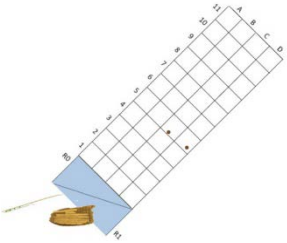
Catalogue number	V1 (almost entirely recomposed from 4 fragments)
Inventory number	AP682+AP732+AP810+AP917
Graphic/Photographic Documentation	Pl. I, Fig. 1
Provenance	AP682: C5 Epsilon 5 AP732: D5 Beta 5 AP810:D5 AP917:C5 
Description	*Olla* almost entirely reconstructed. Globular body, flat base. Rim is everted, with the edge cut off in a straight line. The neck is short and turns sharply into the decorated shoulder.
Decoration	The pronounced shoulder is characterised by a row of square-toothed rouletting. The rest of the body presents horizontal brush strokes.
Dimension	Rim diameter: 13,2 cm Bottom diameter: 9 cm Maximum height: 16,8 cm Maximum thickness: 0,8 cm
Production techniques	The pot is wheel thrown, as suggested by the regular thickness of the wall and by some wheel-marks visible on the inner surface. The base is applied by hand, as testified by some finger prints on the inner surface, at the transition point between base and walls. The underside of the base is characterised by some fine and medium size stone grains that would have ease the removing of the vessel from the wheel.
Usage marks	None

Catalogue number	V2 (almost entirely recomposed from 13 fragments)
Inventory number	AP234+AP461+AP508
Graphic/Photographic Documentation	Pl. I, Fig. 2 Pl. I, Fig. 1 (Photo)
Provenance	AP234: D1 AP461:R0 AP508:R0 
Description	*Olla* almost entirely reconstructed. Globular body, flat base. Rim is everted and slightly out-sloping; the edge is thickened on the outer side. The neck is short and turns sharply into the decorated shoulder; the transition is underlined by a groove.
Decoration	On the shoulder, the *olla* is decorated by a bundle of horizontal combed lines. Brush strokes are visible on the rest of the body.
Dimension	Rim diameter: 13,6 cm Bottom diameter: 9 cm Maximum height: 16 cm Maximum thickness: 1,2 cm
Production techniques	The pot is wheel thrown, as suggested by several features, such as the regular thickness of the wall, the horizontal striations perpendicular to the height of the vessel, visible on both the inner and the outer walls, the presence of medium and small size sand grains on the underside of the base. After the forming, the vessel was smoothed, probably with a wooden stick, whose marks are still visible on the outer surface.
Usage marks	On the inner side of the vessel, at the transition between walls and base, scarce black coloured zone, seemingly traces of organic substances.

Catalogue number	V3 (almost entirely recomposed from 5 fragments)
Inventory number	AP47+AP48+AP174+AP259+AP320
Graphic/Photographic Documentation	Pl. I, Fig. 3 Pl. I, Fig. 2 (Photo)
Provenance	AP47:D1Beta 3 AP48:D1Alpha4 AP174 : D1 AP259: D1 AP320: D1 
Description	*Olla* almost entirely reconstructed. Globular body, flat base. Rim is everted, slightly thickened, with a rounded edge. The neck is extremely short and turns sharply, creating a groove, into the decorated shoulder.
Decoration	The *olla* is decorated by a bundle of horizontal combed lines on the shoulder. Brush strokes are visible on the rest of the body.
Dimension	Rim diameter: 15,6 cm Bottom diameter: 10,4 cm Maximum height: 19,2 cm Maximum thickness: 1,1 cm
Production techniques	Wheel-thrown vessel, as hinted by several horizontal wheel-marks visible on the inner surface. Fingertip impressions on the inner surface, at the transition point between base and walls, suggest that the base was made separately and then applied to the rest of the vase. The presence, on the underside of the base, of some small and medium size stone grains is the result of a method to ease the vase removal from the support on which it was made.
Usage marks	Burn marks are visible in different spot of the exterior surface. Black residues can be seen on the interior of the vase (it is not clear whether they are organic residues or they are caused by post-depositional environment).

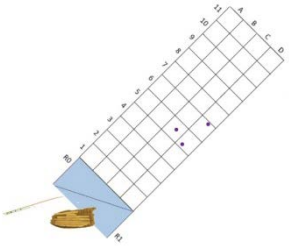
Catalogue number	V6
Inventory number	AP141+ AP249+ AP332+ AP740+ AP805
Graphic/Photographic Documentation	Pl. I, Fig. 4 Pl. I, Fig. 3 (Photo)
Provenance	AP141: B3 Alpha 3 AP249:D4 AP332: B4 Epsilon 3 AP740:C5 AP805: D5 
Description	*Olla* with everted, slightly thickened, rim, with rounded edge. Short neck that turns sharply into a pronounced, decorated shoulder; transition underlined by a groove.
Decoration	Bundles of wavy lines intersecting each others, incised with a comb on the prominent shoulder. Faint brush strokes on the body.
Dimension	Rim diameter: 12,6 cm Bottom diameter: --- Maximum height: 9,8 cm Maximum thickness: 0,7 cm
Production techniques	Horizontal striations, perpendicular to the height of the vase, visible on the inner walls suggest that the vase was wheel-thrown.
Usage marks	Faint burn marks on the exterior surface of the body.

Catalogue number	V7 (almost entirely reconstructed from 11 fragments)
Inventory number	AP868+AP984+AP1042+AP1184+AP1335
Graphic/Photographic Documentation	Pl. II, Fig. 5
Provenance	AP868: C6 Alpha 3 AP984: C6 Alpha 2 AP1042: D6 AP1184: C7 AP1335: C7 
Description	Incomplete *olla* with everted rim, slightly thickened, with a rounded, out-sloping edge. Pronounced decorated shoulder sharply separated from the short neck by a groove.
Decoration	On the shoulder, bundle of four lines deeply incised by a comb. Brush strokes on the body.
Dimension	Rim diameter: 14,2 cm Bottom diameter: --- Maximum height: 13,8 cm Maximum thickness: 1 cm
Production techniques	Horizontal striations perpendicular to the height of the vase visible on the inner surface suggest a wheel-made production.
Usage marks	Traces of sooting on the rim. Faint burn marks scattered on the outer surface of the walls.

Catalogue number	V30
Inventory number	AP741+AP787
Graphic/Photographic Documentation	Pl. II, Fig. 6
Provenance	AP781: C5 AP787:D5 
Description	Fragmentary *olla* with everted, square-cut, slightly out-sloping rim. Very short neck that turns sharply, creating a groove, into the prominent decorated shoulder.
Decoration	Bundle of very thin horizontal combed lines on the shoulder. Faint brush strokes on the body.
Dimension	Rim diameter: 14,6 cm Bottom diameter: --- Maximum height: 11,5 cm Maximum thickness: 0,9 cm
Production techniques	Wheel-thrown as testified by the horizontal striation perpendicular to the height of the vessel visible on the inner surface.
Usage marks	None

Some flat bases belong to his variant. In absence of the prominent, decorated shoulder, identification was based on the fabric characteristics and on the traces left by the production and finishing techniques.

Catalogue number	V16
Inventory number	AP889+AP974
Graphic/Photographic Documentation	Pl. II, Fig. 7
Provenance	AP889:D6 Delta 1 AP974:D6 Alpha 1
Description	Flat bottom of an *olla*; portion of the walls is preserved.
Dimension	Rim diameter: --- Bottom diameter: 9 cm Maximum height: 5,9 cm Maximum thickness: 1,3 cm
Decoration	Faint brush strokes on the exterior walls.
Production techniques	Wheel-thrown vase, as suggested by the faint horizontal wheel-marks visible on the inner surface.
Usage marks	Black, seemingly organic, traces inside.

Catalogue number	V17
Inventory number	AP694+AP750+AP1143
Graphic/Photographic Documentation	Pl. II, Fig. 8 Pl. I, Fig. 4 (Photo)
Provenance	AP694: C5 Epsilon 2 AP750:D5 AP1143:D6 
Description	Flat bottom of an *olla*; portion of the walls is preserved.
Decoration	Brush strokes on the exterior walls.
Dimension	Rim diameter: --- Bottom diameter: 9,2 cm Maximum height: 8,5 cm Maximum thickness: 1,1 cm
Production techniques	Horizontal wheel marks on the exterior walls and small and medium size sand grain on the underside of the bottom suggest a wheel-thrown production.
Usage marks	Fire marks near the base and scattered on the exterior walls.

Catalogue number	V24
Inventory number	AP900
Graphic/Photographic Documentation	Pl. II, Fig. 9
Provenance	B6 Delta 2
Description	Flat bottom of an *olla*; portion of the walls is preserved.
Decoration	Brush strokes on the exterior walls.
Dimension	Rim diameter: --- Bottom diameter: 9,4 cm Maximum height: 10 cm Maximum thickness: 1,1 cm
Production techniques	Wheel-throw and smoothed.
Usage marks	Little black steins (maybe cause by the post-depositional environment) on the inner surface of the wall.

Catalogue number	V25
Inventory number	AP1223
Graphic/Photographic Documentation	Pl. II, Fig. 10
Provenance	C7
Description	Fragment of flat bottom and portion of *olla* walls.
Decoration	Brush strokes on the exterior walls.
Dimension	Rim diameter: --- Bottom diameter: 10 cm Maximum height: 6,2 cm Maximum thickness: 0,7 cm
Production techniques	Regular disposition, perpendicular to the vessel height, of the micaceous inclusions suggest that the vase was wheel-thrown. The flat base was made separately and then attached to the body, as suggested by the fingertip impressions visible on the inner side of the joining point. Small and medium size sand and stone grains on the underside of the bottom and their disposition suggest it was made on a rotating support.
Usage marks	None

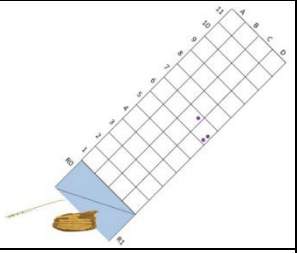
Are going to be listed here also some other pieces, too fragmentary to retrieve from them further information. The reference to them is made providing both the catalogue and the inventory number, a procedure that will be followed for all the pieces without catalogue card presented in the present chapter.

The following rim fragments belong to *ollae 1a*: V4/AP433+AP572); V5/AP858; V8/AP142 and V13/AP696.

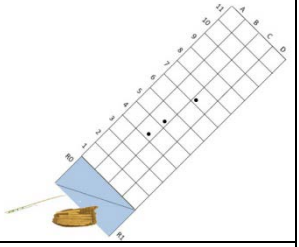
As do the following bases: V9/AP156+AP335+AP770; V10/AP689; V11/AP886; V12/AP978+AP1054+AP1153; V14/AP169+AP175+AP525+ AP576; V15/AP1380; V18/AP1102; V19/AP1031; V20/AP625; V21/AP533; V22/AP937; V23/AP1367; V26/AP85+AP192+AP532; V27/AP211 and V28/AP912.

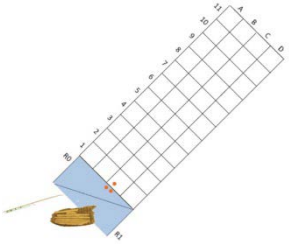
Despite it is not a diagnostic fragments, the body sherd V29/AP692 has been also recognised as an *olla 1a* due to its fabric and morphologic features.

Ollae 1b

Catalogue number	V31 (almost entirely recomposed from 15 fragments)
Inventory number	AP994+AP1003+AP1050
Graphic/Photographic Documentation	Pl. III, Fig. 11 Pl. II, Fig. 5 (Photo)
Provenance	AP994: D6 Alpha 1 AP1003: C6 AP1050: D6 Alpha 1 
Description	*Olla* almost entirely reconstructed. Globular body, flat base. Rim is everted, with a rounded edge. The neck is extremely short and turns sharply, creating an angle underlined by a groove, into the decorated shoulder.
Decoration	The *olla* is decorated on the prominent shoulder by a bundle of horizontal irregular lines, incised with a comb.
Dimension	Rim diameter: 12 cm Bottom diameter: 8 cm Maximum height: 14,4 cm Maximum thickness: 0,8 cm
Production techniques	Wheel-thrown. Small and medium size sand and stone grains on the underside of the bottom suggest that the vase was made on a support.
Usage marks	None

Catalogue number	V32 (almost entirely recomposed from 3 fragments)
Inventory number	AP276+AP423+AP476
Graphic/Photographic Documentation	Pl. III, Fig. 12 Pl. II, Fig. 6 (Photo)
Provenance	R0
Description	Almost entirely reconstructed *olla* with everted rim, cut obliquely toward the outside. Very short neck that turns quite sharply into the prominent decorated shoulder.
Decoration	Bundle of horizontal parallel combed lines on the shoulder. The incision is not regular; some lines are not visible on the entire surface.
Dimension	Rim diameter: 14 cm Bottom diameter: 9,8 cm Maximum height: 16,9 cm Maximum thickness: 0,9 cm
Production techniques	Probably wheel-thrown. The base is made separately and then joined to the rest of the vase.
Usage marks	Burn marks both on the inner and the outer surface. These last one could have been caused by uneven firing conditions, that are responsible as well of the irregular colour of the vase.

Catalogue number	V33 (almost entirely recomposed from 5 fragments)
Inventory number	AP311+AP631+AP1245
Graphic/Photographic Documentation	Pl. III, Fig. 13
Provenance	AP311: B4 Beta 4 AP631: B5 Alpha 5 AP1245: C7 Epsilon 5 
Description	Fragmentary *olla* with everted, slightly thickened rim, with a round edge. Short, concave neck that turns quite sharply into a prominent, decorated, shoulder. Globular body and flat base.
Decoration	Bundle of horizontal, parallel but irregular lines, incised with a comb on the shoulder. Not all the lines are visible on the entire vase surface (their number ranges from four to six). On the body are visible faint traces of brush strokes.
Dimension	Rim diameter: 14 cm Bottom diameter: 9,2 cm Maximum height: 17,2 cm Maximum thickness: 1,1 cm
Production techniques	The angular shape and the coarse size of the inclusion point that they have been intentionally added to the clay as temper. Faint horizontal striations perpendicular to the height of the vessel suggest that it was wheel-thrown. The base is modelled separately and then added to the rest of the vase, as testified by the fingertip impressions at the junction of the two parts, on the inner side of the vase. The features of the decoration hint that it was made while the vase was still rotating on the wheel.
Usage marks	Burn marks on the rim and on the outer walls of the shoulder (but they could have been caused by uneven firing conditions).

Catalogue number	V34
Inventory number	AP20+AP152+AP483
Graphic/Photographic Documentation	Pl. III, Fig. 14 Pl. II, Fig. 7 (Photo)
Provenance	AP20: C1 AP152: R0 AP 483: R0 
Description	Fragmentary *olla* with slightly everted rim, obliquely cut toward the outside. Short neck that turn sharply, creating a groove, into a prominent, decorated shoulder.
Decoration	The pronounced shoulder is characterised by a double row of square-toothed rouletting. Squares of the upper row are slightly smaller than squares in the row below.
Dimension	Rim diameter: 15 cm Bottom diameter: --- Maximum height: 9 cm Maximum thickness: 0,8 cm
Production techniques	The vase seems to be wheel-thrown but there are not clear wheel-marks. A possible hint of the production technique is the regular thickness of the walls.
Usage marks	Faint burn marks at the edge of the rim and on the body, immediately below the decorated shoulder.

Catalogue number	V37
Inventory number	AP999+AP1076
Graphic/Photographic Documentation	Pl. IV, Fig. 15
Provenance	AP999: D6 Delta 1 AP1076:D6 Gamma 1
Description	Fragmentary *olla* with everted, slightly out-sloping rim with rounded edge. Slightly prominent, decorated shoulder.
Decoration	On the shoulder, bundle of combed horizontal parallel lines, ending with a deeper and wider horizontal groove.
Dimension	Rim diameter: 14 cm Bottom diameter: --- Maximum height: 8 cm Maximum thickness: 0,8 cm
Production techniques	Horizontal striations visible on the outer surface suggest a wheel production.
Usage marks	None

Catalogue number	V41 (almost entirely reconstructed from 5 fragments)
Inventory number	AP1088
Graphic/Photographic Documentation	Pl. IV, Fig. 16
Provenance	C6
Description	*Olla* almost entirely reconstructed. Globular body, flat base. Everted rim, thickened and slightly out-sloping. Elongated neck that turns quite sharply into a prominent, decorated shoulder.
Decoration	Bundle of horizontal parallel lines deeply incised with a comb. Faint traces of brush strokes over the entire surface.
Dimension	Rim diameter: 13,2 cm Bottom diameter: 9,6 cm Maximum height: 9,5 cm + 7,1 cm Maximum thickness: 0,8 cm
Production techniques	The *olla* is wheel-thrown, as suggested by faint wheel marks on both the inner and outer walls. The base has been separately modelled and then attached to the rest of the vase, as hinted by fingertip impression at the joining point.
Usage marks	Faint burn marks at the outer rim-edge.

Catalogue number	V46
Inventory number	AP1231
Graphic/Photographic Documentation	Pl. IV, Fig. 17
Provenance	B7 Gamma 3
Description	Fragmentary *olla* with slightly everted rim with rounded edge. Short neck that turns quite sharply into a barely pronounced, decorated shoulder.
Decoration	Bundle of incised wavy lines. The comb was applied steadily, thus the decoration is not equally visible on the entire vase surface.
Dimension	Rim diameter: 17,2 cm Bottom diameter: --- Maximum height: 5,7 cm Maximum thickness: 0,9 cm
Production techniques	Horizontal striations on the inner surface testified a production on the wheel. The outer surface seems to have been finished by a covering with a clay *engobe*. Irregular firing and coiling hinted by the numerous cracks on the surface.
Usage marks	None

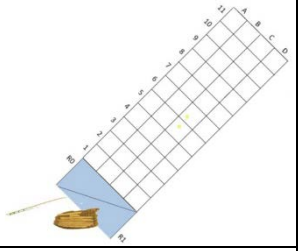
Catalogue number	V315
Inventory number	AP8
Graphic/Photographic Documentation	Pl. IV, Fig. 18 Pl. II, Fig. 8 (Photo)
Provenance	D2 Alpha 5
Description	Fragmentary small *olla* with globular body. Prominent shoulder, separated from the neck by a deeply incised groove. The upper part of the vessel is completely missing.
Decoration	One single incised line on the shoulder.
Dimension	Rim diameter: --- Bottom diameter: 6,6 cm Maximum height: 13,8 cm Maximum thickness: 0,6 cm
Production techniques	The vase was wheel-thrown as suggested by several features: wheel-marks on the outer surface, wheel-ridging on the inner one, traces of string cut (i.e. concentric striation) on the underside of the base. The regular disposition of inclusion on the outer surface could be the results of a finishing treatment, such as a surface smoothing.
Usage marks	Black organic residues inside the vessel.

Catalogue number	V112
Inventory number	AP1048
Graphic/Photographic Documentation	Pl. V, Fig. 19
Provenance	D6 Alpha 3
Description	Flat base and portion of the lower part of the body of a globular *olla.* The walls make a concave entry with the body, meeting the base almost vertically at the attachment point. This results, on the outer surface, in a little shrinking just before the base.
Dimension	Rim diameter: xxx Bottom diameter: 9,4 cm Maximum height: 10 cm Maximum thickness: 1 cm
Production techniques	Wheel-made as suggested by several features: the string cut marks on the underside of the base, the evident wheel-ridging on the interior surface and the horizontal wheel marks visible on both surface. The vase seems to have been smoothed with a wooden stick as suggested by faint marks on the outer surface.
Usage marks	Faint burn marks scattered on both inner and outer surface.

Some fragmentary rims belong to variant 1b: V35/AP212; V36/AP243; V38/AP749; V39/AP399; V40/AP92; V42/AP147; V43/AP336; V44/AP1019 and V45/AP923.

Three fragments of side have been inserted because of both their fabric and morphological features: V47/AP502; V48/AP837 and V49/AP736.

Ollae 1c

Catalogue number	V50
Inventory number	AP849+AP1058
Graphic/Photographic Documentation	Pl. V, Fig. 20 Pl. III, Fig. 9 (Photo)
Provenance	AP849: C5 AP1058:C6 Epsilon 2 
Description	Fragmentary *olla* with everted, thickened rim, slightly out-sloping. Rim edge is flatted and bears, quite in the middle, a groove that could have worked as lid seat. The neck is short, quite concave, and turns quite sharply into a decorated, slightly pronounced shoulder. The joining point is underlined by a deep groove.
Decoration	Bundle of combed incised lines on the shoulder. Not all the lines are visible on the entire surface preserved.
Dimension	Rim diameter: 20,8 cm Bottom diameter: --- Maximum height: 8 cm Maximum thickness: 0,9 cm
Production techniques	Wheel-thrown as suggested by the regular and reduced thickness of the wall.
Usage marks	None

Catalogue number	V51
Inventory number	AP206
Graphic/Photographic Documentation	Pl. V, Fig. 21
Provenance	C3 Delta 4
Description	Fragment of *olla* with everted rim, thickened on the outer side and slightly out-sloping. The rim edge is flattened, with a groove for lid seating. Almost vertical neck that turns sharply, forming a groove, into a prominent, decorated shoulder.
Decoration	Two incised regular lines, quite deep and wide, on the pronounced shoulder.
Dimension	Rim diameter: 17,4 cm Bottom diameter: --- Maximum height: 11,8 cm Maximum thickness: 0, 6 cm
Production techniques	Wheel marks (horizontal striation on the outer surface; wheel-ridging on the inner one) suggest that the vase was wheel-thrown.
Usage marks	None

Catalogue number	V52
Inventory number	AP894+AP990+AP1014+AP1057+AP1082
Graphic/Photographic Documentation	Pl. V, Fig. 22
Provenance	AP894:C6 Epsilon 2 AP990:C6 Alpha 2 AP1014: C6 AP1057: C6 AP1082: C6
Description	Fragmentary *olla* with everted, thickened, out-sloping rim. Very short concave neck that turns sharply into a prominent, decorated shoulder.
Decoration	Bundle of horizontal, combed lines. They are not regular and not very deep; some of them are not well visible on the entire vase surface.
Dimension	Rim diameter: 14,8 cm Bottom diameter: --- Maximum height: 12,5 cm Maximum thickness: 0,9 cm
Production techniques	The inner wheel-ridging suggests a production on the wheel.
Usage marks	None

6.1.2 *Ollae 2*

This type groups a large number of *ollae* characterised by a medium-small flat base, ovoid body and everted rim with a round edge.
They share the same fabric, with quite frequent and well sorted fine glistering flakes of mica and sparse, medium and coarse sharp-edged grains, usually white in colour, that could be either calcite or quartz. Many fragments are featured by small, elongated or irregular voids, resulting from the fading of volatile inclusions during the firing (or from factors due to the post-depositional environment) (see *figure 6*).

Fig. 6. Stella 1, Ollae 2.
Drawing and picture of an almost entirely reconstructed sample

The pottery surface appears quite rough when rubbed with the thumb and freshly broken sections are fine and quite regular. The average maximum wall thickness is 0.8 centimetres.
Almost all the pieces are hand-made, as testified by the general asymmetry of the vessels and by the vertical fingertip impressions still visible on the interior surface. Vases were then finished on the wheel, therefore the exterior surface appears smoothed and still bears some horizontal marks; regular and reduced wall thickness is typical.

Some fragments are characterised at the maximum diameter by several faint horizontal striations, not always visible for the entire girth; it is not clear whether they are an intentional decoration or simply wheel-marks.

Ollae 2 were fired in reducing atmosphere; they appear in dark colour, ranging from grey to black. Despite vases share the same fabric, technology and general features, some minor but intentional differences, mainly concerning the rim profile and the passage neck-rim, lead to the identification of three variants (see *figure 7*).

Ollae 2a are characterised by a simple, everted rim that turns seamlessly into the body. The rim edge is rounded, sometimes slightly thinner.

Ollae 2b rim is everted, sometimes thickened, with a round edge and a slightly flattened inner surface with a small groove, interpreted as a lid seat. The rim turns seamlessly into the vessel body.

Ollae 2c rims are either plain or grooved; these *ollae* are characterised by a visible neck constriction and an acute separation between rim and body. Vessels present a well defined s-shaped profile.

Non-diagnostic fragments were identified and classified within the type on the basis of the distinctive fabric features and the peculiar manufacturing technique.

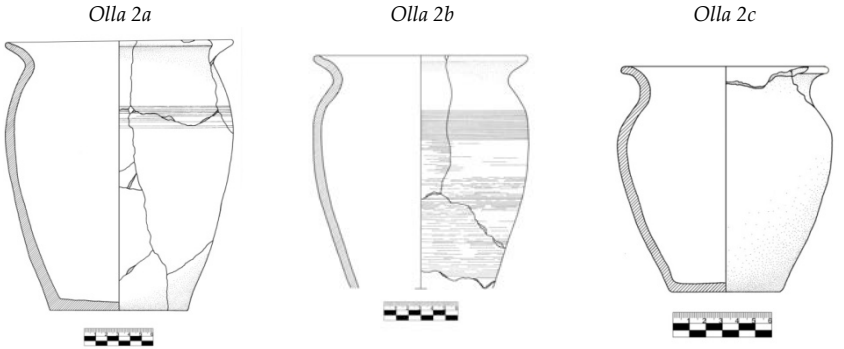


Fig. 7. Stella 1, Ollae 2. *The three variants*

Only vases that share with *ollae 2* morphological features, fabric characteristics and production techniques were taken into consideration in mapping the distribution of the type and in assessing

its chronology[29]. Indeed the extremely simple morphology could have led to recognize as pertaining to this type an high number of vases listed in previously published bibliography, especially when findings are only briefly described and when characterizations lack some technological and/or morphological details.

Ollae 2 are distributed in a limited area in the Eastern part of the *Regio X*; the most Eastern attestations have been identified in Ptuj - *Poetovio,* located along the *via Gemina* (i.e. the first segment of the so called *Amber Road*)[30].

At a first glance *ollae* 2 seem to be attested without evident morphological variations over a long time-span. The oldest samples appear during the *Romanisation* period and the type seems to remain in use till the late Roman-Early Medieval time[31].

However, the wide chronology of the type could be due to its extreme morphological and technological simplicity, that, in the impossibility of an autoptical observation of all the findings, prevents to spot minor details that could lead to identify differences among apparently similar samples.

The widest diffusion of the type should be dated to the 1st century AD. Furthermore, *ollae 2* appeared in *Histria* in this same period, when Romans started to extend their influence in North-Eastern Adriatic; colonies founded in these territories were supplied, for sure in building materials and likely in pottery, by workshops located in the low Friuli plain (and especially in the *Stella/Anaxum* basin)[32].

In Ljubljana - *Emona* and Ptuj - *Poetovio*, that represent the Eastern border for the diffusion of the type, the earlier *ollae 2* are attested in

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[29] The list of the sites where *ollae 2* have been found is provided in *Appendix I*, Table 2: *Ollae 2*, pp. xvi-xix.

[30] A spread of the type in major and minor sites of the Roman provinces of *Noricum* and *Pannonia* is confirmed by a number of small fragments unearthed in these regions. However, since their relative low number and the further consideration that the use of this kind of vessels as transport containers is not yet univocal, it appeared meaningless to list all the single sherds so far collected. For this reason, only the vessels unearthed in the two major cities, *Emona* and *Poetovio*, are listed in the table presented in *Appendix I*.

[31] A list of chronologies of comparative materials is provided in *Appendix III*, Table 2, *Ollae 2*: Chronology, p. lviii.

[32] See chapter 2.2, p. 25.

graves dated to the 1st century AD, suggesting a progressive diffusion towards East of this type, following the Roman expansion.

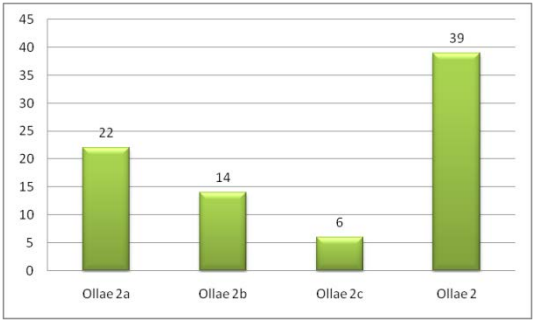

Fig. 8. Stella 1, Ollae 2. *Distribution of variants*

Ollae 2 were found both in settlements and in necropolis. These vases always maintain the same features, proving once again that there was not a specific production for funerary use; *ollae 2* found in necropolis, mainly used as cinerary urns, were everyday-use vases, simply adapted to the new function. Same samples still bear, on different parts of the vase, burnt marks and/or sooted areas, suggesting that they were used as cooking vessels; however, the flat base and the relatively wide opening make these *ollae* suitable for storing and preserving food as well.

Ollae 2 are the most attested type among *Stella 1* materials. As already noticed, the majority of the fragments are bases or non diagnostic sherds, not ascribable to any variant.

Ollae 2a are the most attested, representing the simplest variant (see the graph in *figure 8*).

Within the type, medium size *ollae* are the majority, while small and large *ollae* are both represented by very few samples (see the graph in *figure 9*).

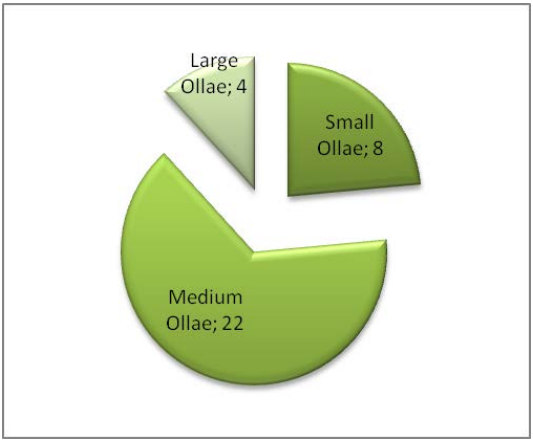

Fig. 9. Stella 1, Ollae 2. *Three sizes*

Since only few vases were entirely preserved or reconstructed, it has not been possible to detect a clear relationship between rim and base diameters, hindering the possibility to retrieve dimensional information from the numerous bases attested in the pottery assemblage.
Within medium size *ollae* two subgroups could be easily identified: the first one gathers medium *ollae* whose rim diameter measures +/- 15 centimetres, while others *ollae* are slightly larger, with an average rim diameters of 19 centimetres.
The consistency of this two groups is further proved by the effects that these differences in sizes have in *ollae 2* carrying capacity, calculated for same samples using the program and the equivalences already presented for *ollae 1*[33].
Without taking into consideration the variants they belong to, *ollae 2* are characterised by the capacities summarised in the table below (see *table 3*):

Olla	**Diam. cm**	**Height cm**	**Capacity Litre**	**Capacity *Sextarius***	**Capacity *Heminae***
V83/AP126	11,6	13,6	1,10	2,01	4,02
V68 / AP879	12,6	17,8	1,47	2,69	5,38
V113/AP457[34]	(15,3)	20	2,61	4,23	8,46
V67/AP716+ AP854+AP891	19,6	23,6	4,57	8,36	16,73
V82/AP733	18,4	23,6	4,51	8,26	16,52

Table 3. Ollae 2, *sizes and capacity*

Rounding off the values, small size *ollae* have a carrying capacity of 2 *sextarii* = 4 *heminae;* smaller medium size *ollae* can carry 4 *sextarii* = 8 *heminae* and medium size *ollae* with a rim diameter of 19 centimetres have a carrying capacity of 8 *sextarii* = 16 *heminae*.
From one size to the other, the capacity doubles each time (see *figure 10*).

[33] See above, pp. 152-153.
[34] But for the missing rims, this vase was almost entirely preserved; the value provided in the table is the measure of the maximum opening at the maximum height of the vase itself.

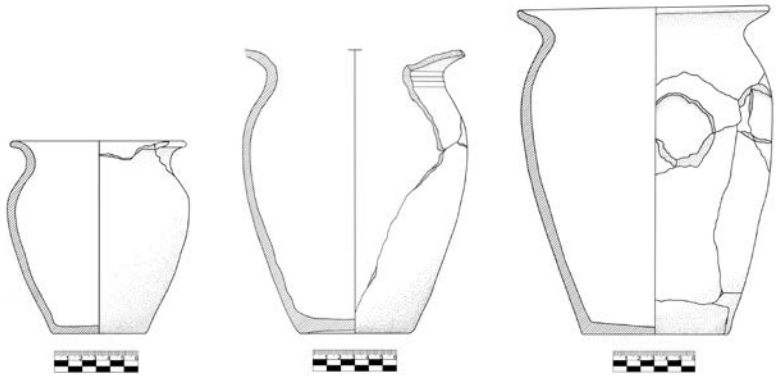

Fig. 10. Ollae 2, *the three modular sizes*

The clear modularity in dimensional value is summarised in the table below (see *table 4*):

Ollae	**Carrying capacity / L**	**Carrying capacity / *sext.***	**Carrying capacity / *hem.***
Small (V83)	1,10	2	4
Medium (rim: 15 cm)	2,61	4	8
Medium (rim: 19 cm)	4,51	8	16

Table 4. Ollae 2, *average capacities per sizes*

V68/AP879 partially falls out of this scheme, but it has to be acknowledge that it has a slimmer profile compared to the rest of *ollae 2* and that minimum variations due to the artisanal production of coarse ware do not invalidate the correlation proved by recurrent values within the type.

Several *ollae 2* show some traces of seemingly organic, usually black substance, remaining of the content, suggesting that these vases were full when they entered the underwater archaeological deposit.

The high number of vessels, their modularity, the residues of content are evidences that *ollae 2* were used as containers of a food stored, and transported, in predetermined and modular quantities. Consequently, it is likely that *Stella 1 ollae 2* belong to the cargo, constituting an unitary batch, and that they were used to trade a peculiar kind of food.

At this point it is also interesting to note that, even if modularity is attested for both *ollae 1* and *ollae 2*, their carrying capacity and the relationship observed moving from one size to the other vary across the types. *Ollae 1* carrying capacity increased of 1.3 moving from smaller to larger size *ollae*, while for *ollae 2* the multiplying factor is 2.
Ollae 1 and *ollae 2* were likely associated to different kind of products, traded in different, but constant, quantities. Further research will be needed, but *Stella 1* materials suggest a relationship between shape and contents, already proved for coarse ware types.
A further proof that *ollae* were traded as food containers is provided by an incision on V82/AP733 (see *figure 11*).

Fig. 11. V82/AP733. Incised signs

On the shoulder, at the maximum girth *circa*, V82/AP733 preserved some vertical signs, intentionally incised on the vase surface before firing.
These signs can be divided in two groups, based on their different features. Two signs are a little bit longer, and they appeared to be traced in a faster way, resulting in a thinner incision compared to the other five lines, shorter and more deeply incised at regular distance.
These signs cannot be easily interpreted; at a first sight they could be read as a numerical indication. However, they do not follow any conventional writing for numbers.
Numerical signs on the external surface of the vase are quite common on pottery used to trade foods; the most common examples are the

tituli picti attested on amphorae necks, that certify the weight of the content. Numerical signs are also attested on some *ollae 1* samples, as presented above[35].

Generally speaking, the presence on V82/AP733 of these signs, that could be read as numbers, provides information to the transported food, both content and quality, and perhaps to the manufacturer.

Interpretation of the signs seems not to be related to the sizes and/or carrying capacity of the *olla*; it is difficult to relate the incision to the values of 8 *sextarii* = 16 *heminae* obtained for V82/AP733.

It could be possible that the numerical signs refer to the weight of the empty vase, i.e. that they were an indication of the tare.

A proof of these possible meaning come from a coarse ware *olla* dated to the 1st century BC recovered in Romanization layers at Sevegliano (UD), that bears an inscription readable as *TP XXX*. The acronym *TP* stands for *Testa Pondo* and indicates the weight of the empty vessel, suggesting that also coarse ware vases could have been used, even in Republican times, as containers to trade some, weighted, foodstuff[36].

Indicating the weight of the empty vessel, and not of the content, was quite common in Roman times and in general in Antiquity; indeed, bearing the value of the tare, the vase could have been re-used several times, even for different contents, since the measure written on it was linked to the vase itself, and not to the content. Incising the tare became thus a way to allow the recycling of the vase, a common practice during Roman times[37].

However, in the case of V82/AP733 incisions seem not to be an indication of the vessel weight; in any ways it has been possible to relate the number of signs with the weight value[38].

Another possible interpretation relates incisions on the shoulder with the production phases, either of the single *olla* or of the daily production[39].

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[35] See chapter 6.1.1, p. 151.

[36] The vase and the meaning of its graffito is widely described in DONAT 2016a, p. 265.

[37] CORTI 2016b, p. 162.

[38] V82/AP733 weights 0,91 kg, resulting, considering 1 Roman *uncia* equivalent to 27,21g, in 33,44 *unciae*. It seems impossible to relate this value to the series of signs incised on the vase shoulder.

[39] CORTI, TARPINI 2012, p. 140.

Unfortunately, within *Stella 1 ollae 2* numerical signs are attested only on V82/AP733; furthermore, possibly numerical incisions are not so far attested among comparable materials collected on other sites. An extension of the research, and the increasing number of coarse ware materials that are now being published, might furnish in the future other samples that will help in finding a correlation, thus providing a definitive interpretation for these incisions. So far, it will be enough to notice that they were made on purpose and that therefore they for sure convey a meaning, likely related to the function and/or the production of the vase itself.

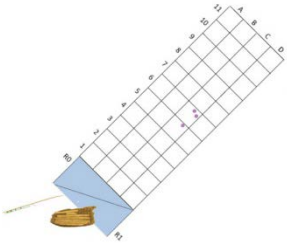
Going back to the whole type *ollae 2*, the high number of vases, combined with the three modular sizes and the evidences that the vessels were full at the moment of the wreck, suggest that they were part of the cargo, as were *ollae 1*.

This type comes more homogeneous than *ollae 1*; it has not been possible to relate any variant to a dating frame nor to a well-defined origin, perhaps because in this case variants have been identified on the basis of minor differences, not necessarily showing a chronological evolution of the type nor a provenance differentiation.

Ollae 2 collected at the *Stella 1* site were used to trade a perishable good, likely different from the one shipped in *ollae 1*, and for sure commercialised in different standard quantities.

It is a challenge to determine the kind of food was preserved in these *ollae*, however the distribution of *ollae* 2 lead to some considerations. The diffusion in a relatively restricted area, coinciding with the *Regio X* and the North-Eastern provinces, points to a regional speciality appreciated by Romanized people, and soon produced in *Noricum* and in *Pannonia*. *Ollae 2* were used to trade and contain either highly perishable food that could have not reached more distant territories, or a variety of local foodstuff that was not appreciated beyond the regional borders.

Ollae 2a

Catalogue number	V67 (almost entirely reconstructed from 19 fragments)
Inventory number	AP716+AP854+AP891
Graphic/Photographic Documentation	Pl. VI, Fig. 23 Pl. III, Fig. 10
Provenance	AP716: C5 Beta 2 AP854: C6 Epsilon 1 AP891: C6 Epsilon 1 
Description	*Olla* almost entirely reconstructed with flat base and ovoid body. Rim is everted, slightly thinned and with a round edge.
Decoration	On the exterior walls, at the point of maximum expansion of the vase, some horizontal striations are visible, even though not on the entire vessel surface. It is not clear whether they are intentional decorations or simply wheel-marks left on the vase surface.
Dimension	Rim diameter: 19,6 cm Bottom diameter: 12 cm Maximum height: 23,7 cm Maximum thickness: 1,3 cm
Production techniques	Hand-made and wheel finished, as suggested by the irregular thickness of the vessel wall and by the fingertip impressions on the inner side combined with the horizontal striation on the outer surface and its smoothed appearance.
Usage marks	Abundant traces of a black substance, apparently of organic nature, on the inner surface of the vase.

Catalogue number	V68 (reconstructed for more than an half from 5 pieces)
Inventory number	AP879
Graphic/Photographic Documentation	Pl. VI, Fig. 24 Pl. III, Fig. 11 (Photo)
Provenance	B6 Gamma 3
Description	Small ovoid *olla* with flat base and everted, slightly thinned rim.
Dimension	Rim diameter: 12,6 cm Bottom diameter: 8,3 cm Maximum height: 17,8 cm Maximum thickness: 0,9 cm
Production techniques	The fingertip impressions visible in different portion of the inner surface suggest that the vase was hand-made. The base was made aside and then attached to the body, as hinted by several deep fingertip impressions at the joining point. The vase was finished on the wheel, as suggested by the regular and almost smoothed outer surface.
Usage marks	On the base, in the inner side, some traces of dark, seemingly organic, substance. Faint burn marks scattered all over the outer surface.

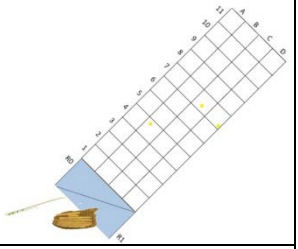
Catalogue number	V321
Inventory number	AP1377
Graphic/Photographic Documentation	Pl. VI, Fig. 25
Provenance	B8 Epsilon 5
Description	Fragment of everted, rounded rim that turn seamlessly into a weakly defined neck.
Dimension	Rim diameter: 17,6 cm Bottom diameter: --- Maximum height: 5,3 cm Maximum thickness: 0,8 cm
Production techniques	Finished on the wheel as suggested by some faint horizontal striation perpendicular to the height of the vessel visible on the outer surface, at the joining point rim-body.
Usage marks	None

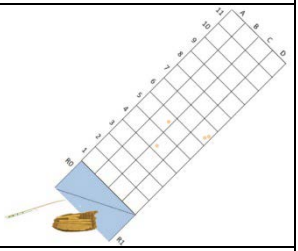
Catalogue number	V322
Inventory number	AP1212
Graphic/Photographic Documentation	Pl. VI, Fig. 26
Provenance	C7
Description	Fragment of everted, slightly thinned rim with rounded edge and portion of almost vertical vessel walls.
Decoration	Faint horizontal striations at the point of maximum expansion, not visible on the entire preserved surface, could be either traces of an intentional decoration or simply wheel-marks, perhaps intentionally left for decorative purposes.
Dimension	Rim diameter: 23,2 cm Bottom diameter: --- Maximum height: 10,8 cm Maximum thickness: 0,7 cm
Production techniques	Fingertip impressions on the inner surface, especially visible at the transition passage body-rim testify an hand-made production while horizontal striations and smoothed exterior surface bear witness of a wheel finishing.
Usage marks	None

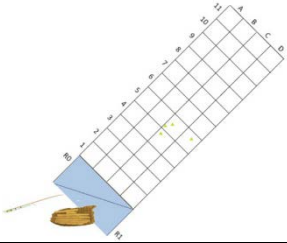
According to their standard features, the fragments V53/AP1186+AP1239; V54/AP1687; V55/AP779; V56/AP1649; V57/AP 695; V58/AP950; V59/AP1121; V60/AP19; V61/AP1490; V62/AP1140; V63/AP345; V64/AP1355; V65/AP1587; V66/AP299; V69/AP1456; V182/AP1383; V317/AP362; V318/AP865 fit into this shape, although too small for further interpretation.

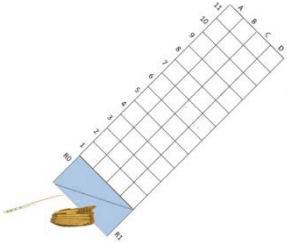
Ollae 2b

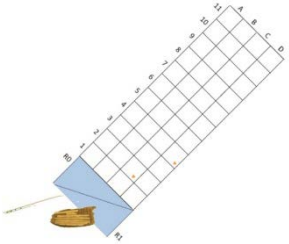
Catalogue number	V82 (entirely reconstructed from 21 fragments)
Inventory number	AP733
Graphic/Photographic Documentation	Pl. VII, Fig. 27 Pl. IV, Fig. 12 (Photo)
Provenance	C5 Epsilon 2
Description	*Olla* with flat base and ovoid body, characterised by a simple, S-Shape profile The rim is everted, slightly thinned, with a round edge; it has, on the interior surface, a groove intended as a lid seat. On the exterior surface, almost in the middle of the body, there are 4 blind holes, with irregular edge. The holes are irregular, two of them are almost circular, and have quite similar dimension, the third one is elongated, the fourth one is again circular but smaller. They seem to have been caused by a detachment of the clay, perhaps during the drying phase, since the inner surface is fired and present the same dark colour of the rest of the vase. On the vase shoulder some incised vertical lines are visible. All of them were made before the firing, on the soft clay. They could be divided into two groups: the first one comprehends two lines, thinner and longer; the second one is composed by six lines, deeper but shorter
Dimension	Rim diameter: 18,4 cm Bottom diameter: 10,6 cm Maximum height: 23,9 cm Maximum thickness: 0,9 cm
Production techniques	The asymmetry of the vase and the countless fingertip impressions visible on the inner surface especially at the joining point body-rim point to and hand-made production. However the vase was wheel finished, as suggested by the smoothed outer surface and by the faint horizontal striations, visible on almost the entire body; they could have been left on the surface in order to provide a cheap decorative pattern.
Fabric	Beside the fabric feature typical of *ollae 2*, this vase ceramic paste is characterised by the presence of some medium size quite frequent red grains of chamotte, proving that inclusions were intentionally added to the raw clay.
Usage marks	Faint, sparse burn marks on the interior, that could be the results of uneven firing conditions.

Catalogue number	V70
Inventory number	AP271+AP1261+AP1304
Graphic/Photographic Documentation	Pl. VII, Fig. 28
Provenance	AP271: B4 Epsilon 4 AP1261:C7 AP1304:D7/L 
Description	Three non-matching fragments all belonging to the same vase, characterised by an everted, thickened rim whose slightly flatten interior surface bears a groove to seat a lid. The passage rim-body is underlined by an evident shrinking.
Decoration	Faint parallel horizontal striation on the curved shoulder.
Dimension	Rim diameter: 18 cm Bottom diameter: --- Maximum height: 7,7 cm Maximum thickness: 1 cm
Production techniques	Hand-made finished on the wheel as suggested by finger impression on the rim edge and by the horizontal wheel-marks on the interior surface.
Usage marks	Burn marks on the inner side, at the transition point rim-body.

Catalogue number	V71
Inventory number	AP295+AP686+AP981+AP1690
Graphic/Photographic Documentation	Pl. VII, Fig. 29
Provenance	AP295: C4 Beta 1 AP686:B5 AP981:D6 Epsilon 3 AP1690:D6 Alpha 1 
Description	Three matching fragments and one detached belonging to an *olla* with everted, thinned rim. The edge is cut straight and, on the inner flatten side bears a groove for the lid.
Decoration	Faint parallel horizontal striations on the curved shoulder that could be either wheel-marks or intentional decorations.
Dimension	Rim diameter: 18,4 cm Bottom diameter: --- Maximum height: 6 cm Maximum thickness: 0,8 cm
Production techniques	Fingertip impressions on the inner side suggest that the vase was hand-made while horizontal striations and the smoothed outer surface point to a wheel finishing.
Usage marks	None

Catalogue number	V80 (almost entirely reconstructed from 9 fragments)
Inventory number	AP165+AP644+AP715+AP772
Graphic/Photographic Documentation	Pl. VII, Fig. 30 Pl. IV, Fig. 13 (Photo)
Provenance	AP165:C4 Delta 5 AP644:C5 Epsilon 4 AP715: D5 Beta 3 AP772: C5 
Description	Almost entirely reconstructed *olla* with ovoid body. Everted rim with a round edge. On the inner side, slight groove intended as a lid seat.
Decoration	Faint, regular, horizontal striations on the body; perhaps they could be wheel-marks left as a decoration.
Dimension	Rim diameter: 17,2 cm Bottom diameter: --- Maximum height: 19,2 cm Maximum thickness: 0,8 cm
Production techniques	Perhaps hand-made and finished on the wheel as suggested by the horizontal disposition of the inclusions and by the presence, on both sides, of regular, horizontal striations.
Usage marks	None

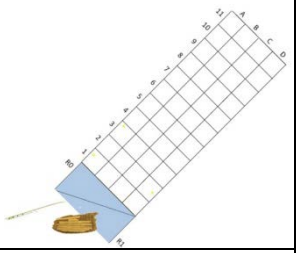
Catalogue number	V81
Inventory number	AP895+AP942+AP972+AP975+AP1041+AP1108
Graphic/Photographic Documentation	Pl. VIII, Fig. 31
Provenance	AP895: D6 Gamma 1 AP942:C6 Gamma 3 AP972:D6 Delta 1 AP975:D6 Alpha 1 AP1041:D6 Beta 1 AP1108:D6 
Description	Fragmentary *olla* with slightly ovoid body, short neck and everted rim, characterised by a rounded edge and a lid seat on the inner surface.
Decoration	Faint horizontal lines at the point of maximum expansion of the vessel. They could be either wheel-marks or intentional decorative pattern.
Dimension	Rim diameter: 17,2 cm Bottom diameter: --- Maximum height: 12,8 cm Maximum thickness: 0,9 cm
Production techniques	Fingertip impressions on the inner side, visible above all at the shrinking point between body and rim, testified an hand-made production. The vase was then finished on the wheel, as suggested by horizontal striation on both side and by the smoothed surface.
Usage marks	Faint burn marks on the interior surface.

Catalogue number	V157
Inventory number	AP99+AP386
Graphic/Photographic Documentation	Pl. VIII, Fig. 32
Provenance	AP99: C2 Beta 1 AP386: D4 
Description	Almost entirely reconstructed *olla* with ovoid body. The rim is everted, slightly thickened and obliquely cut. The inner side of the rim has a slight concave moulding that could be used as a lid-seat. The neck is sharply defined and turns into the shoulder with a shrinkage, underlined by an incised line.
Decoration	Faint horizontal parallel striations, that could be wheel-marks left on the outer surface for decorative purposes.
Dimension	Rim diameter: 16,2 cm Bottom diameter: --- Maximum height: 18,7 cm Maximum thickness: 1 cm
Production techniques	Fingertip impressions on the inner surface combined with the smoothed outer surface characterised by wheel-marks testified that the vessel was hand-made and finished on the wheel.
Usage marks	Faint and sparse burn marks on the outer surface that could have been caused by uneven firing conditions.

V72/AP780; V73/AP724; V74/AP381; V75/AP1691; V76/AP1073; V77/AP43; V78/AP1689 and V79 / AP351 +AP836+ AP1095+ AP1295+ AP1302 belong as well to this variant.

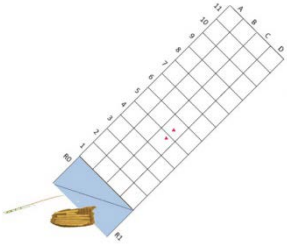
Ollae 2c

Catalogue number	V83
Inventory number	AP126
Graphic/Photographic Documentation	Pl. VIII, Fig. 33 Pl. IV, Fig. 14 (Photo)
Provenance	C3 Beta 5
Description	Small flat base *olla* with ovoid body. The passage between body and rim is underlined by a moderate neck constriction, that creates an evident shrinking immediately above the point of maximum extension. The rim, only partially preserved, is everted, slightly flatten on the upper part; it ends in a round edge.
Dimension	Rim diameter: 11,6 cm Bottom diameter: 6,6 cm Maximum height: 13,6 cm Maximum thickness: 0,5 cm
Production techniques	Hand-made vessel, as suggested by fingertip impressions visible on the interior side of the walls. The vase was then wheel-finished, as testified by the horizontal striations, parallel to the height, visible especially on the interior side of the neck.
Usage marks	None

Catalogue number	V84
Inventory number	AP34+AP131+AP1699
Graphic/Photographic Documentation	Pl. VIII, Fig. 34
Provenance	AP34: A1 AP131:A3 Delta 2 AP1699: D2 Delta 1 
Description	Fragmentary *olla* with ovoid body and everted, slightly thickened rim, ending in a rounded edge. The transition point between neck and rim is underlined by a shrinking.
Decoration	Two/three (they are not equally visible on the entire vessel surface) horizontal regular lines at the shrinking point, that however could be wheel-marks.
Dimension	Rim diameter: 11,6 cm Bottom diameter: --- Maximum height: 10,4 cm Maximum thickness: 0,7 cm
Production techniques	Fingertip impressions inside suggest an hand-made production followed by a wheel finishing testified by the wheel-marks on the outer surface.
Usage marks	None

V85/AP6); V86 /AP1608; V87/AP18 and V88/AP439 belong to the variant 2*c*.

Ollae 2; generic fragments

Catalogue number	V106
Inventory number	AP245+AP712
Graphic/Photographic Documentation	Pl. IX, Fig. 35
Provenance	AP245: C4 Epsilon 4 AP712: C5 Delta 3 
Description	Flat base and portion of the vessel walls that suggest and ovoid, elongated, body. The walls make a concave entry with the body, meeting the base almost vertically at this point. This results, on the outer surface, in a little shrinking just before the base.
Dimension	Rim diameter: --- Bottom diameter: 10 cm Maximum height: 5,8 cm Maximum thickness: 1,4 cm
Production techniques	The vase was handmade and then finished on the wheel. Deep fingertip impressions at the joining point base-walls suggest that the base was separately made and then attached to the rest of the vase.
Usage marks	None

Catalogue number	V108
Inventory number	AP172
Graphic/Photographic Documentation	Pl. IX, Fig. 36
Provenance	C4
Description	Flat base and almost vertical walls belonging to an ovoid *olla*.
Dimension	Rim diameter: --- Bottom diameter: 8,5 cm Maximum height: 5,7 cm Maximum thickness: 1 cm
Production techniques	Hand-made vessel finished on the wheel as suggested by the fingertip impressions on the inner surface combined with the smoothed appearance of the outer one. The base was made separately and joined later to the rest of the vase.
Usage marks	Blackening of the inner surface of the wall that suggests a use of the vase as cooking pot.

Catalogue number	V111
Inventory number	AP885+AP938
Graphic/Photographic Documentation	Pl. IX, Fig. 37
Provenance	C6 Epsilon 2
Description	Flat base and almost vertical walls belonging to an ovoid *olla*.
Dimension	Rim diameter: --- Bottom diameter: 9,6 cm Maximum height: 9,3 cm Maximum thickness: 1,7 cm
Production techniques	Hand-made vessel finished on the wheel as suggested by the fingertip impressions on the inner surface combined with the smoothed appearance of the outer. The presence of numerous voids suggest relatively high firing temperature.
Usage marks	None

Catalogue number	V113
Inventory number	AP457
Graphic/Photographic Documentation	Pl. IX, Fig. 38
Provenance	R0
Description	Fragmentary ovoid *olla*, lacking of the rim. Flat base and ovoid body. Weak neck that turns seamlessly into the body.
Decoration	Three faint horizontal lines at the passage rim-body, that could be wheel-marks left on the surface for decorative purposes.
Dimension	Rim diameter: 1,3 cm Bottom diameter: 7,8 cm Maximum height: 20 cm Maximum thickness: 1,3 cm
Production techniques	Fingerprint impressions suggest that the vessel was hand-made and then finished on the wheel.
Usage marks	None

The following bases belong to *ollae 2*: V89/AP684; V90/AP559; V91/AP1145; V92/AP1146; V93/AP557; V94/AP966; V95/AP1188; V96/AP1117; V97/AP280; V98/AP1244; V99/AP756; V100/AP1693; V101/AP1147; V102/AP523; V103/AP154; V104/AP1372; V105/AP517; V107/AP96+AP104+AP382; V109/AP1562; and V110/AP17+AP626.

The body sherds V114/AP1287; V115/AP738; V116/AP489; V117/AP851; V118/AP1256; V119/AP 478; V120/AP1357; V121/AP552; V122/AP56; V123/AP1386; V124/AP983; V125/AP916; and V126/AP637 are part of non-specified *ollae 2*, as suggested by their peculiar fabric features and the characteristic production technique.

Also the rim fragment V319/AP615 is classified among *ollae 2*; however it is so badly preserved and in so small dimensions that it was impossible to clearly define the variant it belong to.

6.1.3 *Ollae 3*

Ollae 3 regroups a shape characterised by similar rims. *Ollae 3* rims are everted, usually plain, with obliquely square-cut edges. Necks are short and sharply accentuated, usually narrow at the passage rim-body.
The body can be either ovoid or cylindrical. The base is in some cases joint to the vessel walls with a slightly protruding foot, but unremarkable flat bases are attested.
The fabric is quite different for each variant within the group. Most of the pieces are wheel-thrown, and some of them underwent finishing treatments to acquire a smoothed surface (see *figure 12*).

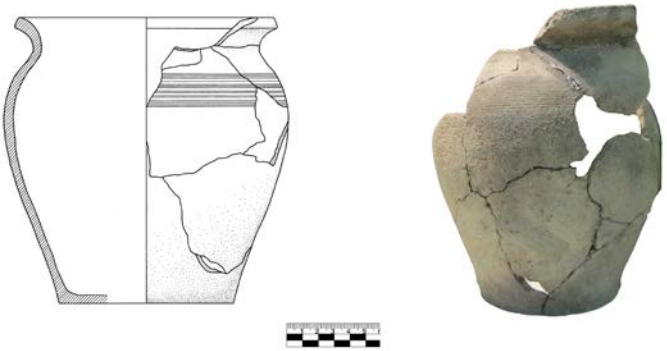


Fig. 12. Stella 1, Ollae 3.
Drawing and picture of a well preserved sample

Some minor differences, however intentionally made by ancient potters, have been considered discriminating factors to identify four variants (see *figure 13*).
In some cases it has been possible to further recognize, within each variant, some subgroups; it has been preferred not to consider them as separated variants, since the main *criterion* inspiring the catalogue was to underline similarities rather than highlight differences.

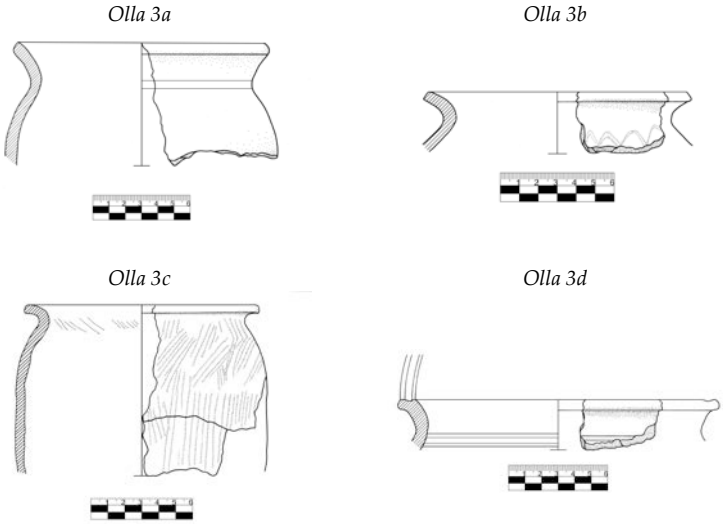


Fig. 13. Stella 1, Ollae 3.
The four variants

These minor differences in rims profile, together with fabric, that led to the identification of the above-mentioned subgroups, hindered the possibility to assess a chronology shared for all the samples belonging to the same variant; however, subgroups are consistent from a chronological point of view.

Despite this apparently inconsistency, type regrouping makes sense; the type gathers together pieces on the base of their main morphological features, that clearly differentiate *ollae* belonging to this type from the other *Stella 1* materials.

Chronological and typological observations about *ollae 3* are going to be discusses for each variants, and in some cases, for each subgroups. In order to be clear, two additional fields, containing the list of the previously published pieces, and the dating they suggest, were added to the catalogue cards.

Dating and distribution are not going to be discussed for the type as a whole, but they differ for each subgroup; for this reason, they are going to be addressed case by case.

Ollae 3a are characterised by an everted, obliquely cut rim. The neck sharply divides the rim from the body of the vase, creating a narrowing above the shoulder (see *figure 14*).

Fig. 14. Stella 1, *an example of* Olla 3a

On the basis of fabric and morphological features four subgroups have been identified.

The first one gathers two almost entirely reconstructed vases, V147/AP973+AP1030 and V127/AP1636+AP1646, and three rim fragments, V138/AP1625, V150/AP519, V156/AP400.

Technological features and the characteristic protruding foot, very similar to V127/AP1636+AP1646, enable to insert into the subgroup the fragmentary base V168/AP987.

Sherds share a homogeneous fabric; they are characterised by sparse, medium and small size inclusions, mainly white grains (calcite and quartz); minute glistering flakes of mica are sometimes visible on the surface.

Vases were fired in a reducing atmosphere; they are usually grey in colour, but burnt marks and spots of different colours suggest uneven firing conditions. The surface is rough to touch, and freshly broken fractures are irregular. The average maximum wall thickness is 1 centimetres. All the vessels were wheel-thrown; only in one case fingertips still visible on the inner surface suggest that the vase was handmade and then finished on the pottery wheel.

Analogies based on published drawing can be treacherous, especially in dealing with such a simple morphology. Nevertheless strictly

morphological and fabric similarities enabled to compare these fragments to some vases found in a number of sites located within *Regio X*[1]; they were all found in layers dated to the late Republican - early Imperial period. Comparable vases were collected both in settlements and in necropolis, suggesting a reuse of the same vessel for different purposes.

Some of the sherds collected at the *Stella 1* site are characterised by blackened areas, resulting from the use of the vessel over the fire, while others bear, on the internal surface, traces of a black substance, seemingly of organic origin, an indication that that they were used as containers. They were likely full when entered the archaeological deposit.

Although based on a slight evidence only, the subgroup seems to have standardized dimensions and volumetric capacity. *Ollae 3* for which it has been possible to calculate the capacity, revealed very homogeneous measures. Their carrying capacity resulted in both cases around 5 *sextarii*, i.e. 10 *heminae*, as summarised in the table below (see *table 5*):

Olla	**Diam. cm**	**Height cm**	**Capacity Litre**	**Capacity *Sextarius***	**Capacity *Heminae***
V127/AP1636+ AP1646	18,4	18,1	2,76	5,05	10,10
V147/AP973+ AP1030	16	18,3	2,84	5,20	10,40

Table 5. Ollae 3a, sizes and capacity

With the exception of V138/AP1625, whose rim diameter of 23,6 centimetres assigned to large *ollae*, the other samples belonging to the same subgroups are all medium size *ollae*, with values comparable to V127/AP1636+AP1646 and V147/AP973+AP1030. These suggest that this kind of *ollae* formed a standardised production, designed for a fixed quantity of content.

This is one more indications that they belong to the ship cargo as suggested by their position in the stream of scattered artefacts: all the samples were indeed located close to the hull remains.

[1] Analogies for each sample of *ollae 3* are listed in the catalogue cards presented below.

Homogenous sizes, as already noticed in *ollae 1* and *ollae 2*, underline their use to trade fixed quantities of perishable goods.
The relatively small number of fragments makes it necessary to approach this conclusion with caution; only further excavation of the site, and a considerable increase in number of similar *ollae*, will shed light on the real function of these vases[2].
It has to be mentioned that the chronology to the 1st century AD is comparable to the one suggested for the hull remains[3] and the other artefacts collected in the area; it fits as well with the *floruit* of both *ollae 1* and *ollae 2*.
V128/AP1697, V130/AP1092, V143/AP250 and V146/AP1366 constitute a second subgroup. Rims are slightly longer and slightly thickened, ending with a little shrinkage immediately below the edge.
Vessel surface appears rough due to the presence of frequent, well sorted, small, medium and large size, sharp-edged, white inclusions.
Fresh breaks are irregular and the average wall thickness is 0.8 centimetres; all the samples were wheel-thrown. Vessels were fired in homogeneous reducing atmosphere, giving them a dark-grey/black colour, both on the surface and in the core.
Only two comparable samples, both found in Late Antique layers of two settlements located in *Regio X*, are published, but they are not fully compatible with the present finds[4].
Both the low number of vessels and their very small dimensions prevent further details in dating.
Three fragments, V144/AP 4, V129 /AP13, and V158/AP718+AP826, belong to the third subgroup. Their rims are longer but less everted compared to the ones of the *ollae* belonging to the first subgroup; they are simpler, not thickened, compared to the second subgroup.

[2] Even if their peculiar characteristics seem to suggest their nature as transport containers, their number is too reduced to take this hypothesis as granted. For this reason, in order to avoid the achievement of misleading results, *ollae 3a* belonging to this first subgroup are not going to be taken into consideration in the further discussion regarding both the nature of the site and the circulation of coarse ware (see chapter 7, pp. 371-406).
[3] See chapter 2.3, p. 30 and the overview of chronology provided by other materials presented in chapter 3.9, pp. 60-68.
[4] Precise references are provided below, in V128/AP1697 catalogue card, p. 219.

All the vessels were fired in oxidising atmosphere, resulting in a colour that ranges from beige to light orange. The surface appears harsh and coarse, since pottery fabric is characterised by medium and large size, sharp-edge white inclusions; on the surface, also some medium size voids are visible. Freshly broken fractures are characterised by small, closely-spaced irregularities and the maximum average wall thickness is 0.7 centimetres, suggesting that the vessels were wheel-thrown, as testified by horizontal striations visible on the internal surface of V158/AP718+AP826.

Precise comparisons have been identified only with two samples found in Late Antique layers of two settlements, both located within *Regio X*; if the similarities enabled to extend the chronology of previously published materials also to the samples from *Stella 1* site, however the low number of sherds hinder the possibility to make further considerations and to retrieve further information from them.

The last subgroup gathers two fragments, V137/AP982 and V155/AP599, morphologically very similar to the one presented above, but very different from a technological point of view.

Sherds of this subgroup are characterised by a dark-grey/black fabric, resulting from a reducing atmosphere during firing. Vessel surface is quite smoothed when rubbed with the thumb; pottery fabric is characterised by sparse, small size and ill sorted inclusions, mainly consisting of minute white grains, mostly quartz, and small glistering flakes of mica. Freshly broken fractures are regular, and average wall thickness is 0.7 centimetres.

Comparisons identified came all from settlements strata but they are not useful from a chronological point of view, since they suggest that *ollae* with these features were produced and remained in use from the 1st to the 7th century AD.

In addition to the ones presented, *ollae 3a* gathers ten other fragments, whose tiny dimensions prevent to surely identify them as belonging to one of the subgroup presented above. However, they surely belong to this variant since they share *ollae 3a* main feature, i.e. the everted, obliquely cut rim. They are going to be simply mentioned since they are preserved in too small portions to provide useful information.

If this first variant turned out to be quite heterogeneous, a completely different situation has been registered for ***ollae 3b***, whose specific morphological and technological features enabled their identification as a type well known in bibliography, the so called *Olle tipo Classe* (see *figure 15*).

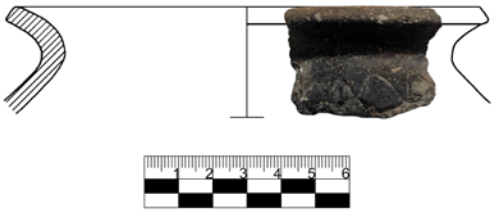


Fig. 15. Stella 1, *an example of* Olla 3b

The type has been identified among the materials collected during the excavation in Classe, the harbour of Ravenna, in nowadays Emilia Romagna (Italy)[5].

Late antique layers brought back fifty coarse ware *ollae* with similar morphological and fabric features. They are characterised by an everted, non thickened rim, cut off in a straight line. The body is ovoid, in most cases flattened, and it ends in a flat, simple, base. The body could be plain, but it is mostly characterised by grooves or combed, waving incisions. *Ollae* of this type share common dimensional features: they are all medium size *ollae*, whose height measures, on average, 16/17 centimetres. They were produced following a good and seemingly standardized technology[6], suggesting a well organised, almost industrial, production[7].

They were made with an almost purified clay, characterised by small size white inclusions, mainly calcite and quartz. Minute, glistering flakes of mica are quite common, as well as small and medium size voids. All the *ollae* were wheel-thrown, and they were fired in reducing atmosphere, resulting in quite homogeneous, dark grey/black colour. Vessel surface appear smoothed, as a result of a finishing process.

[5] GELICHI 1983, pp. 127-129.
[6] BROGIOLO, GELICHI 1986, p. 295.
[7] LAVAZZA, VITALI 1994, p. 39.

Ollae belonging to this type are quite common throughout the South-Eastern Alps and in Northern Adriatic area[8]; *ollae* collected in Classe suggest a dating between the 7th - first half of the 8th century AD.
Further excavations enabled to better assess the chronology of the type, recognising that first samples appeared already at the end of the 4th century AD, and that the type continues until the first half of the 8th century AD. *Ollae* decorated with wavy lines seem to be typical of the 5th century AD[9].
Only nine sherds belonging to this type have been recognised among *Stella 1* materials; none of them is completely reconstructed, and rim diameters attested the presence of both small and medium size *ollae.* However the dimensional values are comparable to the one reported in previously published materials. Despite the low number of sherds and the fact that they are poorly preserved, both plain and decorated *ollae* are represented within *Stella 1* materials.
The fact that they for sure belong to this typology of *ollae* further testifies the presence of Late Antique materials within the stream of scattered artefacts, already suggested by some sherds belonging to *ollae 3a*.
Ollae 3b later chronology clearly indicates that they do not belong to the cargo, neither they are connected with the other main features of the archaeological deposit. As also suggested by their low number, they should be considered intrusive materials, that nevertheless testify for the uninterrupted frequentation of the *Stella/Anaxum* river also after the fall of the Roman Empire.

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[8] A list of comparable materials was provided by Gelichi already in the first definition of the type, where he recalls similar samples from the *castrum* of Invillino-Ibligo in Friuli Venezia Giulia, the Langobard settlement of Castelseprio in Lombardy, the *emporium* of Torcello, the Zignano *castrum* along the *limes* and late antique layers of the *Luni* settlement (see GELICHI 1983, p. 128 and cited bibliography). *Ollae* of this type were found in several other sites throughout Northern Adriatic arch; some of them are going to be mentioned in the catalogue cards dedicated to some specific samples collected at *Stella 1* site. *Ollae di tipo classe*, or very similar samples, are attested as well along the Slovenian coasts and its hinterland: a first list of these Eastern sites can be found in MODRIJAN, MILAVEC 2011, p. 186, that provides specific bibliographical references.
[9] See MODRIJAN, MILAVEC 2011, p. 186: "*In the 5th century the wavy line appeared as a characteristic decorative element*".

Ollae 3c differ from the previous variants for their shorter neck that turns sharply into the vessel body creating a more accentuated shrinkage. The distinctive feature of the variant is however the decoration incised on the body (see *figure 16*).

Fig. 16. Stella 1, *an example of* Olla 3c

The variant gathers only four sherds that could be possibly divided into two subgroups, the first one composed by three fragments, V160/AP1103, V161/AP287, V163/AP222, and the second one by only one sherd, V159/AP455+AP482+AP560, that represents an *unicum* within the type.

V160/AP1103, V161/AP287, V163/AP222 share morphological, technological and dimensional features: they are characterised by a coarse pottery fabric, whose surface appears harsh when rubbed with the thumb. Both the surface and the vessels core are characterised by small and medium size, frequent and well sorted inclusions consisting solely of white, sharp-edged grains. Freshly broken fractures are irregular and the average maximum wall thickness is 0.7 centimetres. All the vessels were wheel-thrown and they were fired in a quite homogeneous reducing atmosphere, resulting in a dark colour, ranging from dark-grey to black.

The three sherds belonging to this subgroup shared the same decorative patterns, consisting of bundles of obliquely combed lines intertwined, creating geometric figures.

They are not matching fragments and apparently they could not be part of the same vase for minor dimensional differences. However they

seemingly belong to the same type of vessel, possibly produced by the same potter and/or by the same workshop. Rims diameters enable to identify within this subgroup three small size *ollae* whose diameters range from 13 to 14,8 centimetres.
Similar materials have been previously found in a number of settlements in the Northern part of the Aquileia's territory, in Late Antique layers, suggesting for this kind of vessels a chronology between the 4th and the 7th century AD, without any possibility to further narrow the time frame.
The last piece belonging to this variant, V159/AP455+AP482+AP560, is characterised by a coarser fabric compared to the previous subgroup; vessel surface is rough when rubbed with the thumb due to the presence of frequent, well sorted, small and medium size inclusions. They are solely white grains, mainly quartz; their angular shape suggests that they were intentionally added as temper to the non-purified clay. Freshly broken fractures are hackly and the average wall thickness measures 0.8 centimetres.
The dark colour, both on the vessel surface and in the core, suggests that the vase was fired in a reducing atmosphere; however, some spots of different colours in different areas of the preserved part testified for uneven firing and/or cooling conditions. The vase was wheel thrown and traces of a black substance, seemingly organic, suggest that it has been used as food containers and that it was probably full when it entered the archaeological record.
Despite their very simple features, strict comparisons have been found in different settlements, all located within *Regio X* borders, suggesting a chronology at the end of the 1st century BC - beginning of the 1st AD.
As already proposed for very similar vases, this kind of *ollae* were a typical production of the *Regio X* and it is likely that these *ollae* derived from late LaTenian models, already attested at the end of the 2nd century BC and whose production went on until Augustan age[10].
Earliest samples are characterised by a poorer quality; they were handmade, with a loose fabric, easily crumbled, suggesting a low firing temperature. With the beginning of the *Romanisation* process, production technology improved, but the morphology remained the

[10] DONAT 2010, vol. II, p. 96.

same, as well as the typical decorative patterns that further prove the derivation of this type from indigenous, Celtic, models[11].
The good quality of the sample collected on *Stella 1* suggests for this piece a chronology at the end of the attestation period, i.e. during the Augustan age. Nevertheless, its uniqueness prevent to further define its relationship with the other materials collected within the area of scattered artefacts.
A low number of fragments is gathered into the variant ***Ollae 3d*** .
All the sherds are preserved only in very small portion, whose everted rim is characterised by a flattened superior edge, crossed by a deep groove, working as lid seat (see *figure 17*).

Fig. 17. Stella 1, *an example of* Olla 3d

Sherds belonging to this variant share the same fabric, characterised by frequent, small and medium size, sharp-edge, white rock grains that are visible both on the surface and in fractures. Pottery surface appears smoothed when rubbed with the thumb since the vases, wheel-thrown, underwent finishing treatments.
The complexity of the shape suggest a dating to the Late Antique period, further confirmed by previously published comparisons.
Given the strong similarities among the three pieces collected within the area of scattered artefacts, that however apparently do not belong to the same vessels, it is possible to extend the dating to the 4th - 7th century AD to all the three pieces.
They are as well intrusive materials, with no relationship with the other features of the *Stella 1* site.

[11] VITRI, SPANGHERO *et Alii* 2004, c. 742. The authors provide here a list of protohistoric settlements, all located within *Regio X* borders, where earliest samples of this kind of *ollae* were found.

Ollae 3 form an heterogeneous group compared to *ollae 1* and *ollae 2*.
Distribution of samples within the identified variants is uneven; *ollae 3a* gathers the highest percentage of sherds, while other variants are represented only by few fragments (see the graph in *figure 18*).

A partial explanation of this uneven distribution lays in the fact that *ollae 3a* comprehends several tiny fragments, some of them poorly preserved; these features pushed towards their identification as *ollae 3a* that represents the simplest variant.

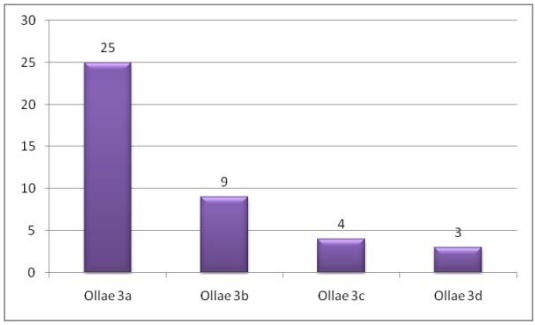

Fig. 18. Stella 1, Ollae 3.
Distribution of variants

Ten fragments have been recognised as belonging to this variant, but it hasn't been possible to further define their characteristics and to assigned them to any of the subgroups previously presented, that have also a chronological meaning.
From this point of view *ollae 3* proved to be an heterogeneous type; besides some pieces that could be dated, on the base of comparable materials, to the Augustan age, several fragments revealed to belong to vases commonly attested during Late Antique, sometimes even early Medieval, ages.
It has to be noticed that, despite the quite high number of later sherds[12], they are almost all very tiny fragments; for none of the sample it has been possible to entirely reconstruct the vase, and matching pieces are quite rare within materials dated to the Late Antique period.
This situation could be read as a hint that these later vases are intrusive pieces, added to pottery assemblage by chance in a moment following its creation, as further suggested by the fact that they were collected in different spots within the area of scattered artefacts, all more or less isolated.

[12] For the list of the chronology assessed for some *ollae 3* sherds, see *Appendix III*, Table 3, *Ollae 3*: chronology, p. lix.

They could not be related to the ship or to bulk of materials collected at the *Stella 1* site that are mainly dated to the 1st - 2nd century AD.
However, later materials have been recognised also among artefacts belonging to other classes (*terra sigillata*, amphore, glassware)[13]; they turned out to be quite useful for an overall interpretation of the site, since they suggest that the river and its shores were still frequented and inhabited after the fall of Aquileia in 5th century AD. Furthermore some materials, as *ollae 3b*, further prove that in Late Antiquity the *Stella* basin remained commercially active and dynamic, since it was still reached by products that came from pretty far away territories.
On the other side, earlier materials, as suggested above, could have been part of the cargo, as evidences that they were full at the moment in which they joined the pottery assemblage, as well as their dimensional uniformity seems to prove.
However it has to be noticed that, if *ollae 1* and *ollae 2* testify for medium-long distance trade, since their distribution turned out to be quite spread[14], the first subgroup of *ollae 3a* that possibly was part of the cargo, gathers material attested only in the nearby city of Codroipo and in two sites of nowadays Slovenia and Istria, whose links with the *Stella* basin during the 1st AD has been already mentioned.
If future finds will enlarge the number of attestation, providing stronger hints to their possible belonging to the cargo, these materials would testify for a local trade, shading light to the complex heterogeneity of the cargo that is going to be further discussed in the next chapter.

[13] See above, chapter 3 and in particular chapter 3.9, pp. 60-68 for a summary of other artefacts chronologies.
[14] As widely demonstrated in the previous paragraph, *ollae 1* were found in different places all around Nothern Italy (see p. 147), while *ollae 2* are attested within the border of *Regio X*, that however comprehends a wide territory (see p. 182). For a visual representation of the two types diffusion, see *Appendix II, Distribution maps* 1, 2 and 3, pp. xlvi-xlviii.

Ollae 3a

- subgroup 1

Catalogue number	V147 (almost entirely reconstructed from 17 fragments)
Inventory number	AP973+AP1030
Graphic/Photographic Documentation	Pl. X, Fig. 39 Pl. V, Fig. 15
Provenance	C6 Gamma 1
Description	Almost entirely reconstructed *olla*, characterised by an everted rim with square cut edge. The neck is short, well defined, and it turns sharply into the decorated shoulder. The *olla* has an ovoid body and a flat base.
Decoration	Faint horizontal parallel incised lines on the shoulder.
Dimension	Rim diameter: 16 cm Bottom diameter: 11 cm Maximum height: 18,3 cm Maximum thickness: 0,8 cm
Production techniques	The vase was wheel-thrown as suggested by horizontal striations still visible on both the inner and the outer surfaces but especially on the last one.
Usage marks	Faint and sparse burn marks on the outer surface, that however could be due to uneven firing conditions.
Comparisons	PETRU 1972, Tav. IX, t. 80, 11 Tav. LXXXIII, t. 44, 18 MATIJAŠIĆ 1991, Tav. 11, t. 23, n. 1 BUORA, CASSANI 1999, p. 110, Tav. XXX, 1
Chronology	End of the 1st BC - beginning of the 1st AD

V127/AP1636+AP1646, almost complete, and three rim fragments, V138/AP1625, V150/AP 519 and V156/AP400 belong to subgroup 1, as well as the base V168/AP987.

Catalogue number	V168
Inventory number	AP987
Graphic/Photographic Documentation	Pl. X, Fig. 40
Provenance	C6 Delta 1
Description	Fragmentary base, joint to the vessel walls creating a slightly protruding foot. Almost vertical walls, belonging to an ovoid vessel.
Dimension	Rim diameter: --- Bottom diameter: 9 cm Maximum height: 10,4 cm Maximum thickness: 1 cm
Production techniques	The internal wheel ridging confirms that the vase was wheel-thrown.
Usage marks	None.
Chronology	End of the 1st BC - beginning of the 1st AD

- subgroup 2

Catalogue number	V128
Inventory number	AP1697
Graphic/Photographic Documentation	Pl. X, Fig. 41
Provenance	D8/L
Description	Fragment of *olla* characterised by a slightly everted rim, faintly thickened. The edge is obliquely cut inside and rounded outside. The neck is quite long, and it sharply divides the rim from the body, creating a faint groove on the outer surface.
Dimension	Rim diameter: 20 cm Bottom diameter: --- Maximum height: 5 cm Maximum thickness: 0,8 cm
Production techniques	Faint horizontal striations perpendicular to the height of the vessel and mainly visible on the outer surfaces are traces left by a wheel-thrown production technique.
Usage marks	Crusty, black residues, apparently of organic nature, characterised the inner surface, immediately below the rim.
Comparisons	RUPEL 1988, c. 114; c. 127, fig. 53 RUPEL 1994, p. 201, Tav. 27, Ccg 9
Chronology	From the 2nd to the 7th century AD

Three rim fragments V130/AP1092, V143/AP250 and V146/AP1366 are inserted in this group.

- subgroup 3

Catalogue number	V144
Inventory number	AP4
Graphic/Photographic Documentation	Pl. X, Fig. 42
Provenance	D2
Description	Fragment of slightly everted rim, with an obliquely cut edge. Quite curved neck that turns into the shoulder creating a shrinkage, underlined, on the outer surface, by two light parallel incisions.
Dimension	Rim diameter: 15,2 cm Bottom diameter: --- Maximum height: 7,5 cm Maximum thickness: 0,7 cm
Production techniques	Wheel-throw as suggested by the regular thickness of the walls.
Usage marks	Faint burn marks on the upper part of the inner side.
Comparisons	FINGERLIN, GARBSH, WERNER 1995, fig. 15,7 BORZACCONI 2004, pp. 57-58, Tav. I, 4
Chronology	6th - 7th century AD

V129 /AP13 and V158/AP718+826 share the same morphological and technological characteristics.

- subgroup 4

Catalogue number	V137
Inventory number	AP982
Graphic/Photographic Documentation	Pl. XI, Fig. 43
Provenance	C6 Beta 2
Description	Fragment of everted, obliquely cut rim with square shape. Shrinkage at the turning point from the short neck to the apparently ovoid body.
Dimension	Rim diameter: 18,6 cm Bottom diameter: --- Maximum height: 8 cm Maximum thickness: 0,7 cm
Production techniques	Wheel-thrown as suggested by the regular and reduced walls thickness.
Usage marks	None
Comparisons	RUPEL 1988, cc. 114; c. 128, fig. 59 VIDRIH-PERKO 1992, p. 351, Tav. 2,6 MODRIJAN, MILAVEC 2011, pp. 192-193, Tav. 95,10 Tav. 106,12
Chronology	1st - 7th century AD

Within the *Stella 1* materials V155/AP599 as well as ten very small, badly preserved fragments, have been identified as *ollae 3a*: V131/AP93, V134/AP873, V136/AP650, V139/AP123, V140/AP132, V149/AP1402, V152/AP387, V153/AP1152, V154/AP1158 and V320/AP774.

Ollae 3b - Ollae "tipo Classe"

Catalogue number	V135
Inventory number	AP1294
Graphic/Photographic Documentation	Pl. XI, Fig. 44
Provenance	D7/L
Description	Fragment of everted rim, whose edge is obliquely cut toward the outside. A shrinkage produced by the short neck divides the rim from the body, apparently with an ovoid shape.
Decoration	Some faint horizontal lines on the outer surface, at the shrinkage. It is not clear whether they are wheel-marks or intentional decorative patterns. One incised line at the end of the neck.
Dimension	Rim diameter: 17 cm Bottom diameter: --- Maximum height: 4,5 cm Maximum thickness: 0,8 cm
Production techniques	Wheel-marks preserved on both sides, but especially on the outer surface, testified that the vase was wheel-thrown and wheel finished, as suggested by the smoothed surface and the regular disposition of inclusions.
Usage marks	None
Comparisons	*Villa Romana* 1999, p. 149, dis. V, 5 CIVIDINI, MAGGI 2014, p. 308, fig. 10, 5
Chronology	4th century AD

Catalogue number	V142
Inventory number	AP1230
Graphic/Photographic Documentation	Pl. XI, Fig. 45
Provenance	A7 Epsilon 3
Description	Fragment of everted, obliquely cut rim and short, sharply defined neck.
Dimension	Rim diameter: 15,6 cm Bottom diameter: --- Maximum height: 4,9 cm Maximum thickness: 0,6 cm
Production techniques	The smoothed surface, the regular disposition of coarse inclusions and the regular thickness of the walls suggest that the vase was wheel-thrown. The colour varies from the black of the exterior surface to the orange of the interior one, indicating uneven firing conditions with sudden alternations of oxidising and reducing phases.
Usage marks	Faint sooting immediately under the rim edge.
Comparisons	RUPEL 1994, p. 204; p. 216, Tav. 30, Ccg 44 COVIZZI 1995, p. 51, Tav. 6, C 1752, ARDIZZON, BORTOLETTO 1996, p. 40, Tav. I, 1B AUGENTI, CIRELLI *et Alii* 2007, p.281, fig. 34a DEGRASSI, GADDI, MANDRUZZATO 2007, p. 505, fig 2.10
Chronology	4th - 6th century AD

Catalogue number	V162
Inventory number	AP1431
Graphic/Photographic Documentation	Pl. XI, Fig. 46 Pl. V, Fig. 16 (Photo)
Provenance	B8
Description	Small fragment of everted rim, obliquely cut toward the outside. Short neck that turns sharply into the decorated body.
Decoration	At the point of maximum expansion, quite irregular, incised wavy line.
Dimension	Rim diameter: 13,6 cm Bottom diameter: --- Maximum height: 3,2 cm Maximum thickness: 0,7 cm
Production techniques	Wheel-thrown, as suggested by horizontal striations visible on the outer surface.
Usage marks	None
Comparisons	FINGERLIN, GARBSH, WERNER 1995, Fig. 15,4 RIAVEZ 1998, p. 48, fig. 19 CORTI, LOSCHI GHIOTTONI 2007, p. 152, fig. 2,5 DEGRASSI, RIAVESE 2008, p. 118, fig. 5, 4 MORANDINI 2008, p. 439, Tav. LXVII, 9 CAGNANA, GAVAGNIN *et Alii* 2010, p. 551, fig. 6 CORTI 2016a, p. 103, fig. 5,74 *Ceramiche in Lombardia*, p. 159, Tav. LXXV, n. 1
Chronology	5th AD - beginning 8th century AD

Also V132/AP215, V133/AP363, V141/AP401, V145/AP342, V151/AP778 and V164/AP1632 have been recognised as belonging to this variant, regardless of their preservartion status.

Ollae 3c

Catalogue number	V160
Inventory number	AP1103
Graphic/Photographic Documentation	Pl. XII, Fig. 47
Provenance	D6
Description	Fragment of everted rim with square-cut shape. Very short neck that turns sharply into the cylindrical, decorated, body.
Decoration	On the body, incised oblique lines crossing each other forming little triangles.
Dimension	Rim diameter: 14,8 cm Bottom diameter: --- Maximum height: 8,7 cm Maximum thickness: 0,7 cm
Production techniques	Wheel-marks visible especially on the outer surface, immediately below the rim, suggest a production on the wheel.
Usage marks	None
Comparisons	NEGRI 1994, p. 71, Tav. 6, 1 PIUZZI 1999, p. 63, Tav. 2, 10-12 LUSUARDI SIENA, NEGRI, VILLA 2004, p. 83, fig. 10, 1-2 CAGNANA, GAVAGNIN *et Alii* 2010, p. 556, fig. 8
Chronology	From the 4th to the 7th century AD

Catalogue number	V161
Inventory number	AP287
Graphic/Photographic Documentation	Pl. XII, Fig. 48
Provenance	D4
Description	Fragment of everted rim with square cut shape. Very short neck that turns sharply into the cylindrical, decorated, body.
Decoration	On the body, bundle of combed lines, both vertical and oblique.
Dimension	Rim diameter: 13 cm Bottom diameter: --- Maximum height: 10 cm Maximum thickness: 0,6 cm
Production techniques	The regular thickness of the vessel walls suggest it was wheel-thrown.
Usage marks	None
Comparisons	NEGRI 1994, p. 71, Tav. 6, 1 PIUZZI 1999, p. 63, Tav. 2, 10-12 LUSUARDI SIENA, NEGRI, VILLA 2004, p. 83, fig. 10, 1-2 CAGNANA, GAVAGNIN *et Alii* 2010, p. 556, fig. 8
Chronology	From the 4th to the 7th century AD

V163/AP222 is not a matching fragment but it shares with V160/AP1103 and V161/AP287 the same morphological, technological and decorative features.

Catalogue number	V159
Inventory number	AP455+AP482+AP560
Graphic/Photographic Documentation	Pl. XII, Fig. 49 Pl. V, Fig. 17 (Photo)
Provenance	R0
Description	Fragmentary *olla* with everted, flatten-edge rim, obliquely cut toward the outside. Short neck, turning sharply into the body, characterised, at the point of maximum expansion, by a incised decoration.
Decoration	Parallel oblique lines, incised on the body.
Dimension	Rim diameter: 17,2 cm Bottom diameter: --- Maximum height: 10 cm Maximum thickness: 0,8 cm
Production techniques	Wheel-thrown, as suggested by parallel horizontal striations, perpendicular to the height of the vase, on the inner surface.
Usage marks	Traces of a black, crusty substance, apparently of organic nature, scattered in different part of the inner surface of the body. Several burn marks that could have been caused by uneven firing conditions, on the outer surface.
Comparisons	RIGHI 1984, pp. 95-98, Tav. 4 BUORA *et Alii* 1995, p. 149, Tav. XX, 1 BRUSTIA 2001, p. 313, fig. 597 ISTENIČ 2000, p. 137, JrC 1.1, Tav. 55, 10 VITRI, SPANGHERO *et Alii* 2004, cc. 741-742, Fig. 6,1-2 DONAT 2010, vol II, p. 96, fig. 3, 1-2
Chronology	second half 1st century BC - 1st century AD

Ollae 3d

Catalogue number	V166
Inventory number	AP1388+AP1391+AP1403
Graphic/Photographic Documentation	Pl. XII, Fig. 50
Provenance	D8/L
Description	Small fragment of everted rim, slightly thickened and obliquely cut on the outer side. The flatten edge is characterised by a deep groove, intended as a lid seat.
Dimension	Rim diameter: 19 cm Bottom diameter: --- Maximum Height: 3 cm Maximum thickness: 1,2 cm
Production techniques	Horizontal striations perpendicular to the height of the vessel visible on both sides testified that the vase was made on the wheel.
Usage marks	None
Comparisons	BIERBRAUER 1987, Type IIIm, Tav. 123, 10-11 AVANZINI, BUSCHETTI *et Alii* 1994, p. 103, fig. 68, Tav. II, 18
Chronology	From the 4th to the 7th century AD

V165/AP1464 and V167/AP757 have to be inserted in this same variant.

6.1.4 *Ollae 4*

This group is composed by a restricted number of pieces, none of them preserving the whole profile of the vase. It has been therefore impossible to define the shape of the base; the vessel body has been simply inferred from the portions preserved in the analysed fragments.
Sherds belonging to this type have been divided into four variants, on the basis of some evident and intentional variations, both in morphological and technological features, macroscopically observed.
Furthermore, some pieces have been recognised as belonging to well-known types, already attested in the existing literature; their recognition pushed toward a further subdivision of the group, despite some variants turned out to be represented by only one fragments
The feature shared by all the pieces belonging to this type is the shape of the rim: o*llae 4* are characterised by an everted, strongly thickened rim, with round edge, clearly separated from the rest of the vase.
Ollae 4a (see *figure 19*) represents the most attested variant within the type, gathering three fragments V174/AP1489, V170/AP1623 and V171/AP1260.

Fig. 19. Stella 1, *an example of* Olla 4a

They are all medium size *ollae*, characterised by a strongly thickened rim, with round edge. The neck is weak and preserved profiles suggest that the vessels should have a globular body.
Fabric is characterised by medium and coarse, well sorted and quite frequent inclusions, mainly white and black rock grains. Coarse,

irregular, brown/orange fragments could be either lumps of clay or *chamotte*, testifying the intentional addition of temper to the raw clay.
Irregular voids are quite frequent; together with the frequent and well sorted inclusions, they make the vessel surface rough when rubbed with the thumb. Inclusions and voids create finely irregular freshly broken fractures. All the vessels bear wheel-marks, suggesting that they were made on the potter's wheel, as confirmed by the regular, thought great, wall thickness. The greyish colour, quite homogeneous both on the surface and in the core, suggests a reducing firing atmosphere.
The morphological simplicity, and the poor preservation conditions of *Stella 1* materials (none of the samples enable to reconstruct the entire shape of the vessel) make it very difficult to find strict comparisons. It has been possible to identify, within published bibliography, similar materials only in some vases buried as grave goods in 1st century BC tombs of Santa Maria di Zevio's necropolis, in the western part of *Regio X* (in nowadays Verona district)[15].
The poor quality of the fabric, as well as the morphological simplicity, pushed towards the extension of this early chronology to *Stella 1* materials; given their low frequency within the area of scattered artefacts, it is likely that they are residual materials, already lying on the river bed before the creation of the main archaeological deposit.
It is also worthy to be noticed that they appeared to be quite scattered in different spots of the archaeological deposit; the presence of this kind of materials seems not to be due to a specific event. Their extremely fragmented state suggested that they were simply discarded into the river, probably in different moment, but surely before the creation of the main deposit.
However, only when the entire area will be completely explored, and the final number of this kind of material will be assessed, a more complete interpretation of their presence could be advanced.
Similar for their morphology to this first variant, ***ollae 4b*** are characterised by a completely different fabric (see *figure 20*).

[15] The precise list of comparisons is provided for at least one sample for each variant in the following catalogue cards.

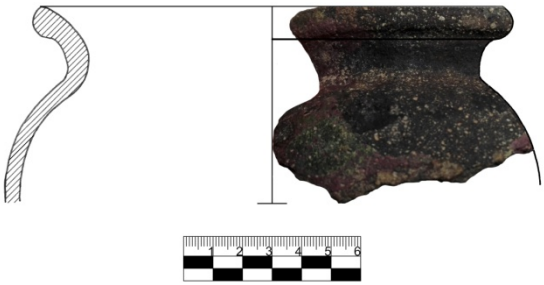

Fig. 20. Stella 1, *an example of* Olla 4b

In this case inclusions are well sorted and quite frequent; however, besides sharp-edge angular white grains that could be either calcite or quartz, it is possible to macroscopically identify some small size, circular, whitish elements, seemingly crushed shells intentionally added as temper to the raw clay, and partially burnt during the firing.
Vessel surface is quite porous, and appears rough when rubbed with the thumb; freshly broken fractures are irregular.
Despite, on average, it measures 0.9 centimetres, wall thickness is regular; this suggests that pots could have been wheel-thrown, even if no clear wheel-marks have been identified on the pottery surface.
V148/AP709 and V172/AP1668, the two *ollae* belonging to this variant, are characterised by an everted, slightly thickened rim, with a round edge. The passage rim-neck is underlined by a slight groove, while the passage neck-shoulder is characterised by a slight shrinkage.
Only one comparable samples has been identified within the current literature; it has been found in the *villa rustica* of Vidulis, in the Aquileia's *ager*, suggesting that it could be a local product. However, the author of the publication didn't provide a definitive chronology, suggesting that it could be dated to the 1st - 2nd century AD as well as to the 3rd - 4th AD[16], hindering the possibility to clearly assess the *Stella 1* materials chronology.
A completely different situation is registered for ***ollae 4c,*** identified as a well-known type already recognised and widely analysed in existing literature. The two pieces belonging to this variant, V169/AP218 and

[16] RUPEL 1988, c. 109.

V176/AP1634 shared the same morphological and technological characteristics of the so called "*olle Sevegliano 4"* (see *figure 21*).

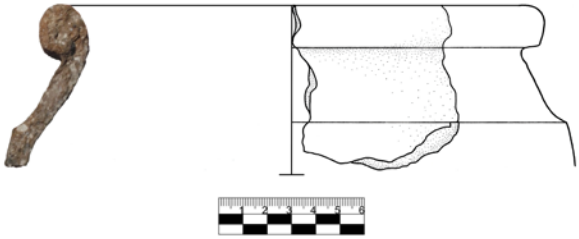

Fig. 21. Stella 1, *an example of* Ollae 4c

Their name derive from the hamlet of Sevegliano, in the Aquileia's territory, where the type was firstly identified in the nineteen nineties. During the excavation of the Roman *forum*, several samples of this kind of *ollae* were brought to light from the lower layers of a well; since they all shared the same morphological and technological characteristics, they were immediately recognised as belonging to the same production, as testified also by archaeometric analysis performed on some samples[17].

Ollae Sevegliano 4, as well as the two samples recognised within *Stella 1* materials, are characterised by a coarse fabric, with frequent, medium and large, sharp-edge inclusions, consisting mainly of quartz and calcite grains. Vessel surface appears quite rough when rubbed with the thumb, however the vases were mainly wheel-thrown. Freshly broken fractures are usually hackly; walls thickness is usually great, but quite regular.

Vessels were fired in quite regular oxidising firing condition, resulting in a brownish-red/orange colour, both on the surface and in the core.

From a morphological point of view, this type of vessel is immediately recognizable by the characteristic *olive-shape* rim: *ollae Sevegliano 4* have a strongly thickened rim, with a round edge, clearly separated from the rest of the vase. The neck is quite long, almost vertical, and turn sharply, creating an angle, into a prominent shoulder, remembering the

[17] For the first identification of the type and for the results of the archaeometric analysis, see CASSANI, FAILLA, SANTORO 1997, pp. 95-98, and relative bibliography.

shape of *situlae*, the typical late Iron age bronze vessel of the *Veneti*, the pre-Romans population that inhabited the western territories of *Regio X*[18].

This kind of *ollae* has been identified in a number of settlements and necropolis all over this area[19]: scarce attestations have been registered in more western territories, particularly in Calvatone, Cremona, Mantova, Manerbio e Modena[20].

Materials unearthed in Sevegliano already suggested for the type a chronology to the pre-Roman period, further supported by comparable materials, all found in layers dated between the end of the 3rd century BC and the beginning of the 1st century AD.

Since the *ollae* that defined the type were found inside a well, and given the fact that almost all the samples collected do not bear traces of an use over the fire, it has been suggested that these *ollae* were used to draw and store water, a possible function that still needs further investigations[21].

From the first identification of the type in the nineteen nineties, several *ollae Sevegliano 4* have been identified, both in settlements and in necropolis, suggesting that this kind of vase could have been used for multiple purposes; besides its main function as storage containers, a re-use as cinerary urn is now widely attested.

Since the knowledge of the type improved throughout the years, other scholars further defined it; *ollae Sevegliano 4* should be now identified with the so called *ollae Gambacurta 53*. G. Gambacurta demonstrated that *ollae* of this type are attested in several sites within the later *Regio X* from the end of the 4th century BC to the very beginning of the 1st AD[22]. Another denomination of the type is *ollae FVG 7.I*, firstly

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[18] See DONAT 2010, vol. II, p. 112: "*G. Cassani, ravvisando nel profilo del corpo, contraddistinto da una spalla fortemente carenata, una somiglianza con le situle metalliche diffuse in ambito veneto nella tarda età del ferro, ipotizza la derivazione del recipiente da questa forma*".

[19] In a second publication of the materials collected in the well of Sevegliano, a list of sites where analogies have been unearthed was provided, mentioning the necropolis of Oderzo and Arquà Petrarca, as well as the settlements of Adria, Montereale Valcellina and Aquileia. For the complete list, and the relative bibliography, see CASSANI 2008, p. 104

[20] See BUORA 2001, p. 164 and mentioned bibliography.

[21] DONAT 2010, vol. II, p. 112.

[22] GAMBACURTA 2007, p. 54, fig. 135.

suggested by P. Donat, whose work further widened the number of attestations, focusing the attention on sites dated to the *Romanisation* period[23].

Progress in the definition of the type, and the increasing number of attestations, make it clear that, even maintaining the typical *olive-shape* profile, *ollae Sevegliano 4* rims could be characterised by slight morphological variations. Samples from *Stella 1* are more similar to the variant 53a in the classification by G. Gambacurta, characterised by a deep groove at the end of the rim edge, that sharply separates it from the neck.

Given the highest number of *ollae Sevegliano 4* now attested in the existing bibliography, in the following catalogue cards are going to be listed only the most precise and accurate comparable materials; they however suggest that the period of highest production of this kind of *ollae* is comprehended between the 3rd and the 1st century BC, further confirming the presence of pre-Roman materials within the area of scattered artefacts.

Ollae 4d are already well known in previously published bibliography; the only piece belonging to this variant is comparable to the so called *olle Gambacurta 52*, characterised by strongly thickened rim, with rounded edge, that however turns seamlessly into the shoulder .

The type appeared firstly at the end of the 3rd century BC, but it reached its maximum diffusion in the following century. It is attested both in settlements and necropolis all around the Western territories of the nowadays Veneto region[24].

Within *Stella 1* materials only the fragmentary *olla* V175/AP297 has been recognised as belonging to this type; it is characterised by a soapy and powdery surface.

Fine and medium size, well sorted and quite frequent inclusions are mainly white and black grains, possibly rock fragments. Rounded brownish/orange circular inclusions could be instead interpreted as lumps of clay. The fabric is characterised by very frequent small and medium size voids, of irregular shape, apparently created by the fading of organic clay impurities during the firing.

[23] See DONAT 2010, vol. II, pp. 110-112, with a list of sites.

[24] GAMBACURTA 2007, p. 110.

The colour is quite homogeneous: external surface, as well as the core, has a buff colour, while some portions of the inner surface are light-grey, maybe because of the reducing atmosphere created inside the vessel placed upside-down on the pottery kiln floor during the firing (see *figure 22*).

Fig. 22. Stella 1, *the example of* Olla 4d

As already suggested by G. Gambacurta, *ollae Gambacurta 52-53*, i.e. *Stella 1 ollae 4b* and *4c*, are widely attested in a broad territory, where they have been found both in settlements and in necropolis, within contexts having the same chronology, dated to the late Iron age - early Roman period[25].

Both *ollae 4c* and *olle 4d*, as well as *ollae 4a*, testified the presence of materials with an earlier chronology within *Stella 1* coarse ware.

Pots dated to pre-Roman period represent only few samples within the area of scattered artefacts and they should be interpreted as residual materials. Nevertheless, a deeper investigation will be necessary at the end of the excavation. Further information could be retrieved looking

[25] GAMBACURTA 2007, p. 111.

at the distribution of these early materials within the area of scattered artefacts, in order to possibly find an explanation for their presence within the archaeological deposit.
As far as this research is involved, it is better to simply notice that they could suggest an early frequentation of the river and its shores, before the arrival of the Romans, leaving any further consideration to the conclusion of the underwater research.
The last variant of this type, ***ollae 4e***, is attested by only one sample, however characterised by peculiar morphological and technological characteristics that force to separate it from other materials.
V173/AP263[26] is characterised by a thickened rim with rounded edge; however the inner profile is concave, creating a place for holding a lid. The fabric is almost depurated, containing only sparse, small size, irregular inclusions. Small flakes of glistering white mica and very fine white grains are recognizable.
The vessel surface appears smoothed when rubbed with the thumb and freshly broken fractures are fine. The colour, both of the surface and of the core, ranges from light-brownish to orange, suggesting oxidising firing conditions.
The only precise comparison has been identified with an *olla* fragment collected on the ploughsoil surface during a fieldwalking survey within the territory of Mereto di Tomba, in the Aquileia's *ager*[27], lacking of any stratigraphic context. The fragment was collected on a site identified as a rural settlement inhabited for a very long period, from the late Republican to the late antique period, therefore its chronology cannot be further determined.
Stella 1 fragment seems to be further comparable to some *ollae* rims from the *castrum* of Ibligo – *Invillino*, gathered together in the type IIIg in Bierbrauer's classification and dated to the Late Antique period[28].
However the small dimensions of V173/AP263 and its uniqueness within the pottery assemblage, hinder the possibility to clearly

[26] The fragment is too small to provide an effective picture; for the drawing, see the plates at the end of the work, in *Appendix IV. Drawing*.
[27] CIVIDINI 1998, p. 47, Tav. 2, Ccg 2.
[28] BIERBRAUER 1987, Tav. 121, 10, IIIg.

compare, and thus date, the fragment, leaving any further consideration to possible future developments of the research.
Despite their low number, fragments belonging to *ollae 4* turned out to be precious sources of information. Overlooking the variants *4b* and *4e*, whose chronology cannot be assessed, the other variants, gathering altogether six fragments, testified the presence of pre-Romans materials within *Stella 1* coarse ware.
They are all poorly preserved (for none of them it has been possible to completely reconstruct the vase they belong to) and they were collected in different spots all over the area of scattered artefacts. Furthermore, some variants are attested only by one sample, suggesting that these vases should be considered isolated sample.
All these elements pushed towards the identification of these earlier artefacts as residual materials; they do not belong to the main pottery assemblage and they should not be linked to the hull remains and to the possible cargo of the ship (or the ships).
Their presence within the stream of artefacts is still waiting for an explanation, that could possibly be found only once the area will be completely investigated.
They could be interpreted as a further proof that the river *Stella/Anaxum* and its shores where frequented before the fully exploitation of the watercourse by Romans, as other findings recovered within the *Stella/Anaxum* basin have already suggested[29].

[29] In the Neolithic settlement of Piancada, located along the river *Stella*, the oldest human skeleton recovered in nowadays Friuli Venezia Giulia has been unearthed. See chapter 2.2, pp. 19-20 and mentioned bibliography.

Ollae 4a

Catalogue number	V174
Inventory number	AP1489
Graphic/Photographic Documentation	Pl. XIII, Fig. 51
Provenance	C9 Alpha 1
Description	Strongly thickened fragmentary rim, with a round edge. The neck is very short and turns seamlessly, only creating a little shrinkage, into the apparently globular body.
Dimension	Rim diameter: 18,4 cm Bottom diameter: --- Maximum height: 7,2 cm Maximum thickness: 1,3 cm
Production techniques	The regular disposition of the inclusions and the horizontally elongated shape of the voids suggest a production on the wheel.
Usage marks	None
Comparisons	SOLZANI 1996, p. 37, t. 32, Tav. XIV, A1 e A2 p. 38, t. 34, Tav. XIV, C p. 40, t. 39, Tav. XVI pp. 40-41, t. 42, Tav. XVI, D1 e D2
Chronology	1st century BC

V170/AP1623 and V171/AP1260 belong to this variant.

Olle 4b

Catalogue number	V148
Inventory number	AP709
Graphic/Photographic Documentation	Pl. XIII, Fig. 52
Provenance	C5 Epsilon 5
Description	Fragmentary *olla* with an everted, slightly thickened rim, with a round edge. The passage rim-neck is underlined by a slight groove, while the passage neck-shoulder is characterised by a slight shrinkage.
Dimension	Rim diameter: 15,6 cm Bottom diameter: --- Maximum height: 6,6 cm Maximum thickness: 0,9 cm
Production techniques	The regular thickness of the wall and the regular disposition of the inclusion on the outer surface suggest that the vessel has been wheel-thrown.
Usage marks	Traces of a black, seemingly organic residues on the rim edge.
Comparisons	RUPEL 1988, c. 109; c. 120, fig. 8
Chronology	From the 1st to the 4th century AD

V172/AP1668 shares the same morphological and technological characteristics.

Ollae 4c/Sevegliano 4 - Gambacurta 53

Catalogue number	V169
Inventory number	AP218
Graphic/Photographic Documentation	Pl. XIII, Fig. 53
Provenance	D3 Alpha 3
Description	Fragmentary strongly thickened rim, clearly separated from the rest of the vase by a deep groove underneath the round edge, on the outer surface. The neck is quite long, almost vertical, and turn sharply, creating an angle, into a prominent shoulder.
Dimension	Rim diameter: 18,6 cm Bottom diameter: --- Maximum height: 6,9 cm Maximum thickness: 1,8 cm
Production techniques	Apparently wheel-thrown, for the regular disposition of the inclusions on the surface.
Usage marks	None
Comparisons	CASSANI, FAILLA, SANTORO 1997, pp. 95-98,fig. 2,2 *Sile e Tagliamento*, p. 36, fig. 7,13 CIPRIANO et *Alii* 1999, p. 47, fig. 7,2 CIPRIANO 2005b, p.48, t. 4, Tav. 2, 1 DONAT, RIGHI, VITRI 2007, p. 113, fig. 26,9 DONAT 2009, pp. 123-124, fig. 9,11
Chronology	End of the 3rd - beginning of the 1st century AD

V176/AP1634 belongs to an *olla Sevegliano 4*.

Ollae 4d/Olle Gambacurta 52

Catalogue number	V175
Inventory number	AP297
Graphic/Photographic Documentation	Pl. XIV, Fig. 54
Provenance	D2
Description	Fragmentary *olla* with everted, strongly thickened rim, ending in a round edge. The neck is short and turns seamlessly into the shoulder.
Decoration	Painted decoration, consisting of a vertical black band that, starting from the rim, crosses (apparently) the entire vase.
Dimension	Rim diameter: 17,4 cm Bottom diameter: --- Maximum height: 10,2 cm Maximum thickness: 1,4 cm
Production techniques	The vessel seem to have been made on the wheel, but there are not clear traces of the production technique.
Usage marks	None
Comparisons	GAMBACURTA 2007, p. 110,fig. 34, 175
Chronology	3rd - 2nd century BC

Ollae 4e

Catalogue number	V173
Inventory number	AP263
Graphic/Photographic Documentation	Pl. XIV, Fig. 55
Provenance	D2 Alpha 2
Description	Fragmentary thickened rim with rounded edge. The inner profile is concave, creating a place for holding a lid.
Dimension	Rim diameter: 17,4 cm Bottom diameter: --- Maximum height: 2,2 cm Maximum thickness: 0,9 cm
Production techniques	Possibly wheel-thrown.
Usage marks	None
Comparisons	BIERBRAUER 1987, Tav. 121, 10, IIIg CIVIDINI 1998, p. 47, Tav. 2, Ccg 2
Chronology	Indefinable

6.1.5 *Ollae 5*

This group gathers a small number of vases, only three, but very similar for both fabric and morphological characteristics, so peculiar and distinctive that the creation of a separate type was deemed necessary.
Only one vase has been almost entirely reconstructed, allowing to infer the morphology of the body and the base; this sample suggests that *ollae 5* are characterised by globular body and flat base (see *figure 23*).

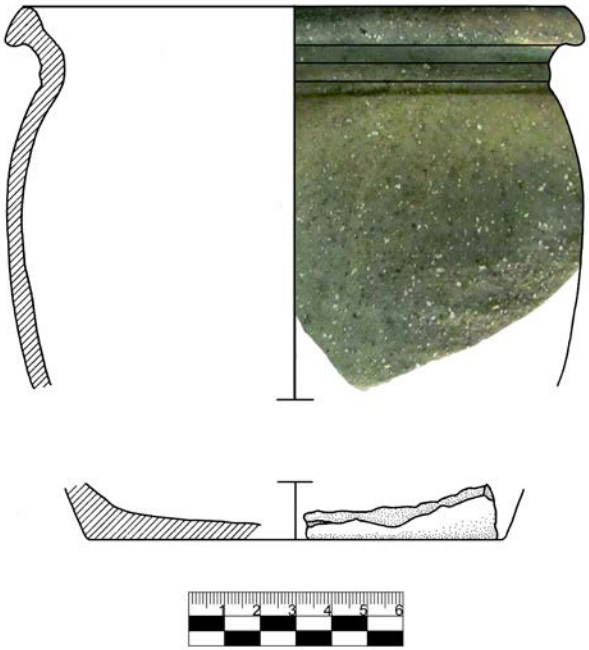
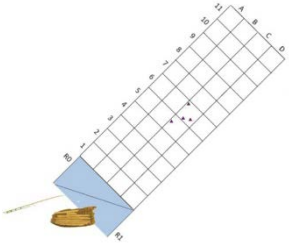


Fig 23. Stella 1, Ollae 5.
The almost entirely reconstructed sample

The type has been mostly defined looking at the rim morphology. Rim is everted, thickened on the outer side, and undercut in the lower part. The rim edge is obliquely inclined towards the outside; the inner edge

of the rim could be straight or could have a groove upon which the lid could rest. The neck is short and well defined and it turns sharply into a slightly pronounced shoulder.
Pottery surface appears rough when rubbed with the thumb. Fabric is characterised by medium and coarse, frequent and well-sorted inclusions. White, black and translucent, sharp-edged grains, supposedly rock fragments, are recognizable, as well as little, almost circular, voids.
Freshly broken fractures have a quite smooth edge. Vessels walls are relatively thick (the average maximum thickness is 1 centimetre), but they are usually regular; all the vessels were wheel-thrown.
The predominant greyish colour testified for reducing firing conditions; however, atmosphere during the fire was sometimes uneven, with alternative, often incomplete, reducing and oxidizing phases that results in some portions, even of the same vase, characterised by an orange colour.
No variants have been identified within the type, although the three vases are little different from each other. For this reasons, the three of them have been drawn, and each one is going to be presented through a dedicated catalogue card.
Minor differences among the three samples led to consider each piece for itself; for this reason a list of comparable materials, and the chronology they suggest, will be provided in two fields added in the catalogue card, as done for *ollae 3* and *ollae 4*.
The three samples belonging to this type turned out to be *unica* within the area of scattered artefacts; for this reason, they couldn't be approached as belonging to the cargo.
A further complication is linked with the chronology assigned to each sample; V178/AP460 and V179/AP753 seem to share a later chronology when compared with the one proposed for the site. V178/AP460 is dated to the 3rd - 4th century AD, while V179/AP753 even later, to the Late Antique period.
Their uniqueness, as well as their extremely poor preservation, possibly linked with this later chronology, suggest to interpret them as intrusive materials.

They are otherwise interesting since comparable materials have been identified within a quite broad area, comprehending the entire Northern Italy, suggesting another time the commercial dynamicity of the *Stella/Anaxum* basin, where goods from different spots of the Empires went on to arrive and be traded also after the 1st century AD, i.e. the period of maximum commercial dynamicity of this territory.
A different situation should be noticed for V177/AP827+AP877+AP986+AP989+AP1694; several analogies, found in different sites within the *Regio X*, suggest indeed a chronology to the late Republican - early Imperial age, compatible to the general chronology of the *Stella 1* site.
No other sherd with comparable features has been found in the area of scattered artefacts; it is difficult to interpret it as a vase belonging to the main cargo, but the fact that it has been possible to almost entirely reconstruct its profile and that matching fragments were found within a restricted area (they have been all collected in different parts of the same excavation square) could be read as a hint that it was part of the main pottery assemblage, possibly as personal belonging of a crew member or, even more probably, as part of the board equipment.
If this interpretation remains only likely, it has to be noticed that strict comparisons, both from a morphological and technological point of view, have been found in a restricted area, limited to the *Regio X* borders. It could be read as a further hint of the cultural homogeneity of this region and as a proof of the circulation at a regional level, if not of the same pots, at least of the same models.

Catalogue number	V177 (almost entirely reconstructed from 7 fragments)
Inventory number	AP827+AP877+AP986+AP989+AP1694
Graphic/Photographic Documentation	Pl. XV, Fig. 56
Provenance	827: C5 AP877: C6 Beta 1 AP986: C6 Gamma 1 AP989: C6 Alpha 2 
Description	Almost entirely reconstructed *olla* with flat base and globular body. The rim is everted, thickened on the outer side, undercut in the lower part and slightly out-slanting. The neck is short; the joining point between neck and shoulder is underlined by a small cordon, with circular section. The base belongs to the same vase, but it doesn't match to any other fragments.
Decoration	Clay cordon at the passage neck-shoulder.
Dimension	Rim diameter: 15 cm Bottom diameter: 12 cm Maximum height: 11 cm + 1,5 cm Maximum thickness: 1,2 cm
Production techniques	Wheel-thrown.
Usage marks	None
Comparisons	DELLA PORTA, SFREDDA 1996, pp. 142-143, Fig. 189 CIVIDINI 1997, p. 57, Tav. 5e, Ccg 22 MAGGI 1998, p. 146, Tav. 30, Ccg17 CIVIDINI 2000, p. 44, Tav. 6, Ccg 1 p. 74, Tav. 20, Ccg 8 MAZZOCCHIN 2004, p. 142, Fig. 68,1 MORANDINI 2008, p. 434, Tav. LXIV, 12
Chronology	1st century BC - 1st century AD

Catalogue number	V178
Inventory number	AP460
Graphic/Photographic Documentation	Pl. XV, Fig. 57 Pl. V, Fig. 18 (Photo)
Provenance	R0
Description	Two joining fragments of *olla* 5, preserving only the upper part of the vase. The *olla* is characterised by a short, obliquely everted rim, slightly thickened on the outer side, and undercut in the lower part. The inner edge of the rim is slightly concave on the inner side. The concave neck is extremely short and it turns sharply into a prominent shoulder.
Decoration	One incised line at the joining point neck-rim.
Dimension	Rim diameter: 19 cm Bottom diameter: --- Maximum height: 7,5 cm Maximum thickness: 1 cm
Production techniques	Horizontal striations perpendicular to the height of the vessel visible on the inner surface suggest that the vase was wheel-thrown. The fabric is characterised also by some *chamotte* inclusions, testifying an intentional addiction of impurities as temper.
Usage marks	None
Comparisons	RUPEL 1988, c. 112; c. 125, fig. 39 RUPEL 1991, p. 149; p. 154, Tav. 21, Ccg 16 CEAZZI, DEL BRUSCO 2014, p. 944, fig. 6,4 CIVIDINI 2017, p. 246, Fig. 15.1 OŽANIĆ ROGULJIĆ 2007, pp. 186-187, pot type CCP3 *Ceramiche in Lombardia*, pp. 155-156, Tav. LXIX, 2, type 72A
Chronology	3rd - 4th century AD

Catalogue number	V179
Inventory number	AP753
Graphic/Photographic Documentation	Pl. XV, Fig. 58
Provenance	D5
Description	Very small fragment of everted rim, thickened on the outer side, and undercut in the lower part. The rim edge is obliquely inclined towards the outside and slightly out-sloping. The inner edge is concave, forming a little groove upon which the lid could rest. Inside, the rim is sharply separated from the neck.
Dimension	Rim diameter: 19,6 cm Bottom diameter: --- Maximum Height: 2,7 cm Maximum thickness: 1,2 cm
Production techniques	Wheel-thrown, as suggested by wheel marks visible especially on the outer surface and on the rim edge.
Usage marks	Black patina residues, seemingly of organic nature, on the inner surface.
Comparisons	BORCHIA 2008, p. 120 Tav. XIII, n. 7 CEAZZI, DEL BRUSCO 2014, p. 944, Fig. 6, 10 BIERBRAUER 1987, Tav. 76, 8 III f3 CIVIDINI 1997, p. 53, Tav. 5d, Ccg15 MANDRUZZATO 2008, p. 98, Tav. XIV,8
Chronology	3rd - 7th century AD

6.1.6 *Ollae 6*

Olle 6 is a small group of small and medium size *ollae*.
They are characterised by a similar plain, elongated, vertical rim, with round edge that turns seamlessly into the vessel body. The transition is slightly narrow.
The type gathers only four fragments, further subdivided, according to main differences in their fabric, into two subgroups, each one composed of two pieces.
The first subgroup gathers the entire vase V184/AP278 and the rim fragment V180/AP846, characterised by small and medium size, sharp-edged, white grains, sparse and well sorted. Very fine flakes of glistering mica can be seen on the surface. They are disposed in parallel lines, suggesting that the vase underwent finishing treatments to obtain a smoothed surface. Fresh breaks appear regular and slightly curved, and wall thickness, measuring on average 0.6 centimetres, is regular. Vessels have been fired in a constant reducing atmosphere, resulting in a homogeneous black colour, both on the surface and in the core.
The extreme simplicity of the shape led to identify comparable materials in countless sites all around the Roman Empire. Since most of them have nothing in common but the plain shape, only finds from the neighbourhood of the *Stella 1* site have been taken into account. Further bibliographical references rather than suggesting a circulation of the same production, must be considered as locally manufactured pots, following one single multi-functional and practical model.
Materials unearthed in stratified contexts suggest a chronology at the end of the 1st BC - beginning of the 1st AD, in concordance to the data of *Stella 1* materials.
V184/AP278 (see *figure* 24) was found entirely preserved. It is a small size *olla*, the smallest pot within *Stella 1* coarse ware. Its carrying capacity was calculated in 0.525 Litres, very close to 1 *sextarius* (i.e. 2 *haemina*). One *sextarius*, correlated with the multiplied content of both *ollae 1* and *ollae 2* that belong to the cargo, is by all means the basic production unit for the shipped foodstuff.

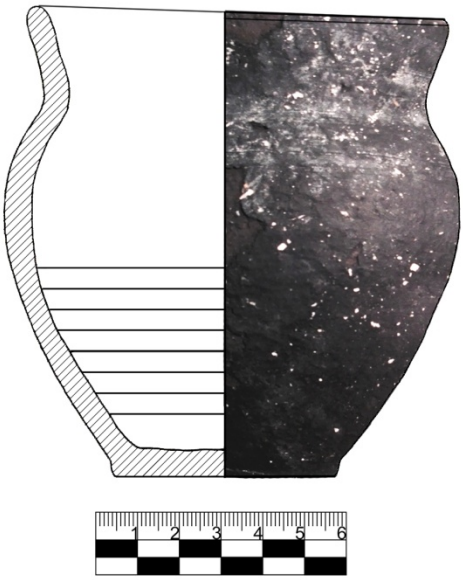


Fig. 24. Stella 1, Ollae 6.
The entirely preserved V184/AP278

The vase could have been therefore used as standard unit of measure, adaptable to solid food. Nevertheless, it represents the only vase of this type so far collected within the area of scattered artefacts; any further consideration appears thus premature.

The fragmentary rims V183/AP875 and V181/AP1333 have been separated and have been considered as a second subgroup because of their completely different technological characteristics.

Both vases were fired in oxidising atmosphere, resulting in a beige/light brownish colour; the presence of spots with colour variations testified uneven firing and/or cooling conditions.

Fabric is characterised by very frequent and well sorted inclusions, whose dimensions range from fine to very coarse. They are mainly fine, almost circular, black grains and coarse, sharp-edged, white grains. Small voids are quite frequent.

The surface appears rough when rubbed with the thumb, but fresh breaks are quite regular. The thickness of the walls range from 0.9 to 1.4 centimetres. Both vases were wheel-thrown.
The simple plain shape seems to find analogies everywhere and therefore references have been handled with restriction.
Within the *Regio X* strict parallels have been identified with materials whose derivation from proto-historical models have already been suggested by previous literature[30].
First attestations are dated in the 1st century BC, but the type disappeared at the very beginning of the 2nd century AD.
Given their low number, *ollae 6* collected within *Stella 1* area of scattered artefacts can be interpreted as intrusive materials. However their chronology is compatible to the bulk of the cargo, and, at least the *ollae* belonging to the first subgroup are likely to have been used as part of the board equipment. This is particularly true for V184/AP278, whose carrying capacity suggests its possible use as unit of measurement for solid food.
Furthermore, the dimensions of all the vases gathered in this type (three small *ollae* and one medium size) suggest also their interpretation as personal belonging of the crew members.
Surely, none of this materials belong to the ship cargo; for this reason, they will not be taken into consideration for a further interpretation of the site, neither in order to reconstruct coarse ware pattern of trade and distribution.

[30] For all the samples listed in the following catalogue card, the authors suggest a possible derivation from pre-Roman materials: BUSANA, NICOSIA *et Alii* 2011, p. 55 recall the similarities with Venetian coarse ware; CORTI 2016a, p. 98 makes references to Latenian productions and OŽANIĆ ROGULJIĆ 2009, p. 91 derives them from proto-historical prototypes.

- Subgroup 1

Catalogue number	V184
Inventory number	AP278
Graphic/Photographic Documentation	Pl. XVI, Fig. 59 Pl. V, Fig. 19 (Photo)
Provenance	C4
Description	Entirely preserved small *olla*, with vertical rim ending in a round edge. The neck does not exist and the long rim turns, without creating any sharp angle, into the slightly prominent shoulder. The body is globular and the base is flat.
Dimension	Rim diameter: 10 cm Bottom diameter: 5,2 cm Maximum height: 11,2 cm Maximum thickness: 0,6 cm
Production techniques	Wheel-thrown, as suggested by several elements, such as the string-cut on the underside of the base, the internal wheel-ridging and the countless parallel horizontal striations visible on both interior and exterior surface. The regular disposition of the inclusions and the smoothed appearance of the external surface testify that the vase was burnished and smoothed before firing.
Usage marks	None
Comparisons	RUPEL 1991, p. 147; p. 149, Tav 20, Ccg 1 RUPEL 1994, p. 200; p. 206, Tav. 26, Ccg 1 CASARI 2002, p. 115, fig. 59 *Triesta Antica*, p. 106, Tav. 24, 1 TRATNIK 2014, p. 279, Tav. 17, fig. 130 Luni I, pp. 422-423, Tav. 52, S.13, 52, CM. 2364 Tav. 75, 1 CM. 2225/1
Chronology	Second half 1st BC - 1st AD

The rim fragment V180/AP846, a small *olla*, belongs to this subgroup, on the basis of fabric features.

- Subgroup 2

Catalogue number	V183
Inventory number	AP575
Graphic/Photographic Documentation	Pl. XVI, Fig. 60
Provenance	R0
Description	Fragmentary small *olla* with vertical, round edge rim. The passage rim-shoulder is underlined by a shrinkage. The body is globular.
Dimension	Rim diameter: 13,4 cm Bottom diameter: --- Maximum Height: 7,4 cm Maximum thickness: 1,4 cm
Production techniques	Wheel-thrown as suggested by the wheel-ridging on the inner surface, the horizontal striations visible on both sides, and the regular disposition of the inclusions, on parallel lines.
Usage marks	None
Comparisons	MANDRUZZATO 2008, p. 98, Tav. XIII, 13 OŽANIĆ ROGULJIĆ 2009, p. 91, Tav. 6,4 3; Tav. 13,16 BUSANA, NICOSIA et *Alii* 2011, p. 55, Tav. 8,6 TRATNIK 2014,p.279, Tav. 7, fig. 42 CORTI 2016a, p. 98, fig. 1.11
Chronology	1st century BC - beginning 2nd AD

V181/AP1333 has been inserted within this subgroup.

6.1.7 *Ollae 7/Ollae Cassani/Ollae Pavia di Udine I-III*

This group gathers a small amount of heavily fragmented pieces whose peculiar features led to identify them as belonging to a type already well attested in the Aquileia's territory, the so called *ollae Cassani/Pavia di Udine I-III* (see *figure 25*).

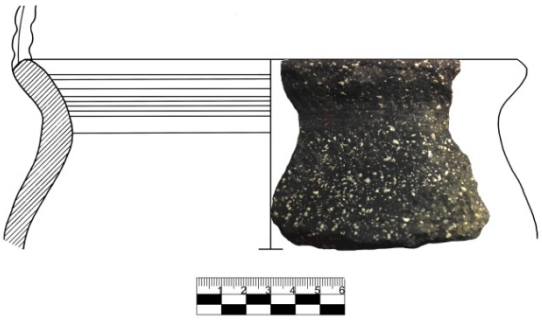


Fig. 25. Stella 1. *An example of* olla 7

The denomination derives from the fact that this kind of *ollae* were firstly identified and defined by G. Cassani in 1991, in her study of coarse ware unearthed in a well at the *villa rustica* in the nowadays municipality of Pavia di Udine (UD)[1].
Materials that allowed the definition of the type were found within a closed context, a pottery dump dated to the Augustan age; further excavations in other stratified contexts confirmed the chronology from the very end of the 1st century BC to the middle of the 1st AD.
Ollae Cassani/Pavia di Udine I-III (see *figure 26*) are medium and large size *ollae*, characterised by a flat base and a globular body. The external surface is usually decorated by heavily combed lines, both vertical and horizontal, frequently combined creating a variety of geometric patterns. Rims are slightly everted, almost vertical and thickened, with a round or flattened edge, often characterised by a regular pinched decoration. Frequently an incised line runs all around the superior edge of the rim, especially when it is flatten or straight-cut.

[1] CASSANI 1991.

Fig. 26. An entirely preserved sample of olla Pavia di Udine/Cassani I-III, *now at the National Archaeological Museum of Aquileia*
(*From* GIOVANNINI 2015, *fig. 6, p. 532*)

Fabric is homogeneous across the type. Vessels surface is rough to the touch, due to the presence of medium and coarse size inclusions. They are mainly sharp-edge white grains, both white quartz and calcite, frequent and well-sorted. Freshly broken fractures appear sharp and wall thickness is considerable, giving to vases a heavy weight compared to their size. Thick walls with faint traces of coiling show they were hand-made, but some wheel-marks on fewer samples, as well as sand grains on the outer side of the base, testify that they were finished on the potter's wheel.
Fired in constant reducing atmosphere, they appear in homogeneous dark grey/black colour, both on the surface and in the core.
Ollae of this type were polyvalent vases. They have been found in kitchens and storerooms of different types of settlements, proving their use as cooking and/or storage vessels. Less frequently they have been unearthed in graveyards, where they were re-used mainly as cinerary urns.
A nowadays long tradition of studies enables to recognised this kind of *ollae* as a local production, deriving from pre-Romans antecessors, the so-called *olle a scopetto*, produced between the end of the 6th and the beginning of the 1st century BC, in an area more or less coinciding with the nowadays Friuli central plain, where *olle Cassani* were later spread[2].

[2] DONAT 2016b, p. 222.

The growing number of coarse ware publications in the past few years considerably increased our knowledge about this kind of *ollae*, enabling scholars to better define their distribution area.

Ollae Cassani are frequent and well attested in the lower Friuli plain, where the highest concentration has been registered in Aquileia's *ager*. Several *ollae* of this type were unearthed along the *Stella/Anaxum* river[3].

Few samples have been found in some settlements in Carnia, near the Alpine passes; they are attested in the settlements of Verzegnis[4], Raveo[5] and Moggio Udinese[6] along the *via Iulia Augusta* that starting from Aquileia headed to *Noricum* through the mountain pass of Monte Croce Carnico/Plöckenpass. Nevertheless they remained spread South of the Alps and no samples of this vase have so far been found across the Northern border of *Regio X*.

They are recovered less frequently in the territories West of the Tagliamento river and in the Trieste's *ager*.

The Western border of the distribution area has been considered for long the Roman settlement in nowadays Portogruaro[7]. The present work extends research in distribution on the Southern border until the city of Adria, where similar samples have been recovered and identified within the pottery dump in via Retratto[8], in contrast to the

[3] An update lists of analogies is provided in *Appendix I*, Table 3: *Ollae 7*, pp. xx-xxiv, that provided *data* for the distribution map presented in *Appendix II*, *ollae 7*. Distribution map, p. xlix.

[4] Several *ollae* belonging to this type were unearthed during the excavations of the pre-Romans and Roman settlement in Colle Mazeit. See VANNACCI LUNAZZI 2003, Fig. 7.2, cc. 731-734 and VANNACCI LUNAZZI 2008, p. 191.

[5] Different samples have been found in two votive deposits in the pre-Romans and Roman sanctuary. It is likely that they were used during ritual banquets and then smashed and ritually buried. See DONAT, RIGHI, VITRI 2007, p. 110, Fig. 22, 10 and p. 114, Fig. 26,3 e 26,7.

[6] Several fragments have been recognised within coarse ware collected in the Roman settlement on the hill. See FALESCHINI 2018, p. 239, p. 256, Tav. 4, 64-74, fig. 13

[7] The Westermost sample of this kind of *ollae* has been for long identified in a cinerary urn unearthed in grave 2 of the necropolis of Giussago of Portogruaro. See CASSANI 2008, p. 117, where a map of findings known at that time is also provided.

[8] I would like to thank dr. V. Mantovani, who is currently studying materials from Adria-via Retratto and who kindly shared with me this information, providing me the results of her preliminary study on these materials.

traditional idea that these *ollae* did not reach the nowadays Veneto region[9].

Ollae Cassani are commonly considered as a local production of the *Regio X*, and recent excavations and research suggest that they are likely to have been produced within the territories of the lower Friuli plain.

Indeed several *ollae* of this kind were unearthed in a pottery kiln excavated in the nineteen sixties in Aquileia, in the so-called Monastero area, hinting at a production of this vases also in the main city[10].

Within the *Stella/Anaxum* basin, *ollae* of this type are likely to have been produced in the pottery workshop belonging to the *villa rustica* identified in Rivignano, loc. Flambruzzo/Il Bosco[11], close to the river, located in a privileged position near to two minor roads, both linked with the *via Postumia*, that would have eased the trade of the products.

Ollae 7 turned out to be quite frequent along the first segment of this main consular road; this circumstance is very interesting also considering that *via Postumia* started in Aquileia, where this *ollae* where surely fired within the pottery kiln of Monastero, and crossed the *Stella/Anaxum* basin, thus passing by the other productive centres for *ollae 7* so far recognised.

Overall, looking at their distribution, *ollae 7* are mainly attested along some preferential roads, exploiting which they reached territories even far away from the productive centres, but always within the regional borders.

Since the good, but quite standard quality of *ollae Cassani/Pavia di Udine I-III* could not justify the trade of these vases for themselves, it is more likely that it was the perishable content of these vases to be marketed.

Ollae Cassani remained however spread only southern of the Alps; this could be read as an hint either of an highly perishable content, that could not be transported over long distances or of common goods,

[9] Until very recent time it was believed that *ollae Cassani/Pavia di Udine I-III* remained spread within the border of nowadays Friuli Venezia Giulia (see VENTURA 2015, p. 332).

[10] *Made in Roma and Aquileia*, p. 170.

[11] For a description of the pottery kilns excavated in this site and for a list of evidences that *ollae Cassani/Pavia di Udine* I-III were produced there, see CIVIDINI, MAGGI MAGRINI 2006, p. 72 and CIVIDINI, DONAT et *Alii* 2006, p. 31.

produced in Northern provinces as well, whose markets were thus already saturated and where Italian products did not find their way.
A less frequented commercial route, whose use for *ollae 7* trade is otherwise confirmed by several samples unearthed along its path, has been identified in the main road that connected Aquileia with Trieste. Following the Southern extension of this road, *ollae* of this kind also arrived in *Histria* and one sample, testified by one fragment, finally reached *Pula*[12]. This South-Eastern productions were possibly manufactured on the Peninsula, but further archaeometric analysis are needed in order to understand whether they are North-Italian products or local vases manufactured following foreign models.
Regarding the presence of *ollae 7* in Adria, it has to be reminded that this city was well connected with the Northern Adriatic arch through endo- and peri-lagunar routes. It is likely that *ollae 7* samples reached this area exploiting watercourses. A river transportation of these vessels is otherwise suggested by the presence of *ollae 7* at the *Stella 1* site. Furthermore, *ollae* of this type are likely to have been produced in Aquileia, and, since the colony was a main commercial *emporium,* its products could easily reached, even sometimes only sporadically, also unusual markets.
Stella 1 area of scattered artefacts produced only six *ollae Cassani/Pavia di Udine I-III*, none of them completely reconstructed. Only in one case one rim was associated to its base, while in the other case only the rim with a variable portion of the vessel body was preserved.
Ollae 7 constitute an homogeneous group, composed by medium size vases, with similar rim diameters. From a technological point of view, all the vases shared very similar fabric.
The great wall thickness and faint traces of the coiling junctions suggest that they were handmade, but some wheel-marks, as well as the presence of sand grains on the outer side of the base suggested that they were at least finished on the potter's wheel.

[12] One fragment has been identified within the coarse ware unearthed during urban excavations led between the first and the second World War (STARAC 1997, p. 154, Tav. IV.1). Unfortunately it was not possible to perform an autoptic evaluation of the piece, however both the morphological and the fabric descriptions are comparable with this type of *ollae*.

As for *ollae 1* and *ollae 2*, the two fields dedicated to comparisons and chronological assessment have been removed from the catalogue cards, since *ollae 7* belong to a well-defined type dated to the Augustan/Julio-Claudian age, while the long list of comparisons, provided for the type as a whole, is contained in the table inserted in the *appendix*[13].

It is quite difficult to clearly interpret the presence of *ollae 7* at the *Stella 1* site, within the area of scattered artefacts. Two arguments point to their use as part of the cargo, i.e. the registered use in local trade and economy, and their dimensional homogeneity, that suggests that they were used to store and transport for regular standard sizes of content.

However, their early chronology is not completely fitting into the dating of the shipwreck, since *ollae Cassani/Pavia di Udine I-III* reached their highest diffusion during the Augustan age, while *Stella 1* starts slightly later, from the second half of the 1st century AD.

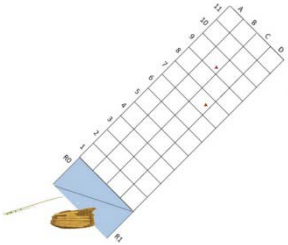
It seems that *ollae 7* were already at the end of their production when the archaeological deposit was created; the few vases added to the cargo could have been some of the last, perhaps reused, specimens of *ollae Cassani/Pavia di Udine I-III*.

[13] See *Appendix I*, Table 3: *Ollae 7*, pp. xx-xxiv.

Catalogue number	V185
Inventory number	AP1225
Graphic/Photographic Documentation	Pl. XVII, Fig. 61
Provenance	C7
Description	Fragment of everted slightly thickened rim with straight obliquely cut edge. The exterior part of the long rim is completely decorated.
Decoration	Parallel, oblique, combed lines.
Dimension	Rim diameter: 18,4 cm Bottom diameter: --- Maximum height: 5,3 cm Maximum thickness: 1,2 cm
Production techniques	Handmade with coiling and then wheel finished as suggested by faint horizontal striations, perpendicular to the height of the vessel, on the interior side.
Usage marks	None

Catalogue number	V186
Inventory number	AP1385
Graphic/Photographic Documentation	Pl. XVII, Fig. 62
Provenance	D8/L
Description	Small fragment of everted rim with rounded edge. The rim is short and turns immediately into the decorated body.
Decoration	Series of short oblique notches at the joining point rim-body.
Dimension	Rim diameter: 17 cm Bottom diameter: --- Maximum height: 3,5 cm Maximum thickness: 1 cm
Production techniques	Handmade and then wheel finished.
Usage marks	Faint traces of black seemingly organic substance on the interior edge of the rim.

Catalogue number	V187
Inventory number	AP884
Graphic/Photographic Documentation	Pl. XVII, Fig. 63 Pl. VI, Fig. 20 (Photo)
Provenance	B6 Delta 4
Description	Fragment of an *olla Pavia di Udine I-III* with everted, slightly thickened rim with straight edge, obliquely cut. The rim edge is pinched; the exterior walls are completely decorated.
Decoration	The upper edge of the pinched rim bears an incised line. The body is externally decorated by bundles of alternatively oblique and horizontal lines, incised with a comb.
Dimension	Rim diameter: 20 cm Bottom diameter: --- Maximum height: 7,7 cm Maximum thickness: 1,1 cm
Production techniques	Handmade coiling; on the inner side of the rim, of some evident horizontal grooves, that represent the junctions of the coil; the regular disposition of inclusions hints to a wheel finishing treatment.
Usage marks	None

Catalogue number	V188
Inventory number	AP1209+AP1484
Graphic/Photographic Documentation	Pl. XVII, Fig. 64
Provenance	AP1209: C7 AP1484: B9 
Description	Two fragments, one of the rim (AP1484) and the other of the base (AP1209) of an *olla Pavia di Udine I.* The rim is everted, thickened, pinched and with a flat edge. The outer walls are decorated. The base is flat; the decorated walls are joint creating a simple angle.
Decoration	The pinched rim is decorated, on the outer side, by a series of irregular oblique incised lines. The lower part of the vase bears a composite decoration: three horizontal parallel lines at the joining point body-base and oblique, parallel but irregular incised lines on the body.
Dimension	Rim diameter: 17,6 cm Bottom diameter: 13,4 cm Maximum height: 7,1 cm+4,3 cm Maximum thickness: 1,4 cm
Production techniques	The vase was handmade with the coiling technique, as suggested by evident horizontal grooves at the junctions of the coils still preserved on the interior part. The underside of the base is characterised by some sand and rock grains that should have made easier the detachment of the vase from the wheel thus suggesting, combined with faint horizontal wheel-marks, visible mainly on the lower part of the vase, that is was then finished on the wheel. Fingertip impressions on the interior side, at the joining point with the walls, suggest that the base was made separately and then attached to the rest of the vase.
Usage marks	Sooting and burnt marks on the interior side of the lower part of the vase (AP 1209).

Catalogue number	V190
Inventory number	AP1278
Graphic/Photographic Documentation	Pl. XVII, Fig. 65
Provenance	B7
Description	Fragment of slightly everted, thinned rim with round edge.
Decoration	The rim is pinched, though the decoration is not regular. On the rim edge a single line was sharply incised.
Dimension	Rim diameter: 16 cm Bottom diameter: --- Maximum height: 6 cm Maximum thickness: 1,4 cm
Production techniques	Handmade with the coiling techniques and then finished on the wheel as suggested by some faint horizontal striations.
Usage marks	None

V189/AP1499, despite its poorly preservation state, has been identified as an *olla 7*.

6.1.8 *Ollae 8/olle a orlo modanato*

Ollae 8 is referring to a type well-known in the literature, spread in a wide area that comprehends almost the entire Northern Italy, along the river Po and its tributaries.
They show a globular body, with a prominent shoulder, usually decorated with a single row of incisions or rectangular/oval notches, but plain samples are well attested. Bases are rather small, usually flat, sometimes tending to cylindrical; large size vases are occasionally associated with convex bases.
Frequently the underside of the base presents some sand grains, confirming that this *ollae* were wheel-thrown[14].
Ollae 8 are characterised by a *cavetto rim*, curved outwards in a concave, quarter-round profile. It ends with a small, semi-circular clay ridge, sharply defined between deep incisions. The thickened edge is either flat or rounded (see *figure 27*).

Fig. 27. Stella 1.
An example of olla 8

Rims and decorations of the recovered samples show minor differences, but a long tradition of studies widely demonstrated that these variations do not have any chronological and/or functional

[14] See RATTO 2014, p. 180: *"La conformazione del fondo (…) è tuttavia ricostruibile dagli innumerevoli confronti, che attestano per una maggioranza di fondi piani, spesso sabbiati, e un numero assai più limitato di fondi a calotta, in genere associati a olle di grandi dimensioni e di forma bassa e globulare, che necessitavano dunque di un sostegno per essere poste nel focolare"*.

meaning[15], so they have not been taken into consideration to further divide the type in variants.
According to macroscopic fabric differences *Stella 1* finds have been divided in two variants that founds strict analogies in published materials and should be considered typical for the form (see *figure 28*).

a. Olla 8a *b. Olla 8b*

Fig. 28. Stella 1, Ollae 8. *The two variants*

Ollae 8a are characterised by a finer fabric, almost depurated. Very fine glistering flakes of white mica, frequent and ill-sorted, are the most common inclusions. Small size white grains, either calcite or quartz, are less frequent; small and medium size grains of *chamotte* can be rarely observed.
The surface appears smoothed to the touch, polished and glistering due to the regular disposition of micaceous inclusions.
Freshly broken sections are smooth, without visible irregularities; wall thickness is regular, with an average of 0.8 centimetres.
Vessels were fired in a quite homogenous oxidising atmosphere, resulting in a predominant orange or light-brownish colour; variations

[15]See CHIOCCI 1999, p. 133: "*Queste olle sono caratterizzate da decorazioni incise a tacche o a motivi geometrici realizzati a pettine o a stecca, ma né queste né la morfologia dell'orlo sembrano potersi assumere a criterio cronologico o tipologico discriminante*".
A first attempt to create a typology for this kind of *ollae* was made for the samples collected in the *villa rustica* of Caselette, in nowadays Piedmont , but it ended in the acknowledgment that decoration could not be used as a tool that provide trustable chronology because, at least within coarse ware, it turns out to be very conservative, in both techniques and decorative patterns (see REBAUDO GRECO 1980).

in colours can be sometimes observed within the same sample, testifying for sudden changes in firing and/or cooling conditions.

Ollae 8b present a coarser fabric. Medium and large size, well-sorted inclusions, mainly sharp-edge white grains, less frequent darker rock fragments and *chamotte* pieces are visible in macroscopic observation.

These inclusions made the pottery surface rough when rubbed with the thumb and cause frequent irregularities in freshly broken fractures.

Walls thickness is slightly larger than *ollae 8a*, with an average of 0.9 centimetres.

Vessels seem to have been fired in irregular firing conditions; their colour ranges from orange, to brown to dark grey. Marked colour changes can be frequently observed within different portions of the same vase.

The coexistence of these two variants, one gathering *ollae* characterised by an almost depurated fabric, usually fired in oxidising atmosphere, and the other grouping vessels made with a coarser clay, could be observed in several sites where these *ollae* were found in quite high number and it has already noticed in previous literature[16].

The two variants should be therefore approached as an inner feature of the type and they have been explained as functional variations. According to some scholars, *ollae 8a*, more depurated, were used as containers, to store or serve food, while *ollae 8b*, rich in inclusion, were adapted to thermal shocks and therefore mainly employed as cooking

[16] It would be impossible to quote here all the sites were both fabric variants have been recognised. However, it has been considered worthy to quote some passages taken from literature that attest the coexistence of the two kind of fabric within *ollae* 8 found in sites located far away from each other.

For *ollae 8* collected in the *villa rustica* of Chiunsano, within *Regio X* border, see CORTI 2016a, p. 99:*"Per quanto riguarda le olle sono documentate anche ceramiche con impasto più fine, ma inquadrabili nello stesso gruppo, e ceramiche morfologicamente affini ma realizzate con materia prima diversa, sia con impasto più o meno ricco di inclusi, che in ceramica depurata"*.

See BULGARELLI, TORRE 2004, p. 74 for samples unearthed in *Vada Sabatia*/Vado Ligure, in *Regio IX*: "*Al gruppo a impasto grossolano e granuloso, di dimensioni maggiori, con decorazioni a tacche e incisioni articolate e complesse, che secondo parte della critica recente sembrano inserirsi in una tradizione indigena preromana, si affianca il tipo di dimensioni più contenute e impasto depurato, con decorazione a tacche incise sotto l'orlo. Tutte le decorazioni sono impresse prima della cottura. Il tipo più depurato mostra chiari segni di lavorazione al tornio, mentre l'altro presenta talvolta tracce di una lisciatura interna ed esterna*".

pots[17]. Sooted area and burnt marks on several samples, both within the *Stella 1* materials and in comparables *ollae* found in different sites all over the diffusion areas, further prove that *ollae 8b* were commonly used over the fire, as cooking pots.

Besides the findings in settlements, a large number of samples belonging to this type was found also in necropolis, where they were used both as cinerary urn and as grave goods; since so far there are no proofs of a production specifically made for funerary destination[18], their presence in necropolis further testify a re-use of these vases for a destination different from the original one.

From a chronological point of view, *ollae 8* remained in use for a very long period, thought with major differences across the time span.

First samples appeared in the second half of the 1st century BC, but the type reached its highest diffusion during the 1st AD. At least some *ollae 8* may be long lived, since they are still present in 3rd - 4th century contexts, however usually characterised by a high percentage of residual materials[19].

The early appearance of the type suggested that it derives from pre-Roman prototypes; a further hint in this direction is the simple geometric decoration that, according to the majority of scholars, preserves indigenous motifs also during Roman times[20].

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[17] "*La morfologia è apparentemente comune, ma declinata in numerose varianti nella versione decorata e in quella liscia. Variabili sono infatti sia la foggia in cui si distingue sia una forma da fuoco più larga e bassa e una di dimensioni inferiori, più sviluppata in altezza, da dispensa e da cucina – sia l'impasto- più grossolano con numerosi inclusi, o omogeneo e depurato*." BULGARELLI, TORRE 2004, p. 74.

[18] Indeed a number of samples found in necropolis bear burnt marks and sooted areas, suggesting that they were used as coking vessels before their final destination as grave goods or cineray urn.

[19] AURIEMMA *et Alii* 2008, p. 169.

[20] Several authors have already proposed to identify *ollae 8* prototypes in pre-Romans productions. It will be impossible to quote here all the references, but it is worthy to be reminded that *olle 8* found within *Regio X*, have already been linked with celtic productions: see VENTURA, CIVIDINI 2007 pp. 226-228: "*Il prototipo di questo contenitore sembra riconoscibile in alcuni esemplari datati ad epoca protostorica (…). Per alcuni studiosi questa forma va ricollegata a tradizioni celtiche, anche in considerazione della sintassi decorativa*".

Since *ollae 8* have been found in several sites, and a number of local productions has been presumed[21], scholars made references to different local *substrata*, speaking alternatively of Celtic, *Ligures* and more generally indigenous productions, but always linking these *ollae* with Northern Italian pre-Romans populations[22].

It is indeed true that these *ollae* seem to be completely different from the cooking and storage vessels attested in the Mediterranean area[23]; morphological characteristics, technological features and decorative patterns have been considered as a derivation from pre-Roman traditions common in a wide area comprehending all the territories at the foot of the Alpine arch[24].

Indeed this kind of *ollae* are attested, with minor morphological differences, in countless sites over a very broad area, coinciding more or less with the entire Northern Italy.

Several samples have been found within *Regio X* borders, even if this type are less widespread compare to a local productions like *ollae 7*.

The highest number of comparisons is registered in Aquileia, where *ollae 8* are known from both settlements and necropolis; samples decrease, remaining however quite frequent, within the ancient Roman colony's administrative borders, while *ollae* belonging to this type are

[21] Considerations about the geographical spread of this *ollae* are going to be provided below, as well as a list of so far identified local productions.

[22] See CORTI, TARPINI 1997, p. 121: "*A seconda dell'area geografica di rinvenimento, si è parlato di sostrato preromano di tradizione celtica per quanto riguarda l'area piemontese (Rebaudo Greco 1977, p. 35-36; Rebaudo Greco 1980, p.145; Bacci Spigo 1979, p. 78), e di tradizione ligure per le olle di Caprauna (Olcese 1993, p.107; Gandolfi-Gervasini 1983, p. 96), sempre però in riferimento a produzioni appartenenti al periodo della romanizzazione o della romanizzazione avvenuta*".

[23] See GARANZINI, QUERCIA 2016, p. 257: "*I tipi morfologici maggiormente comuni sono le olle ad orlo sagomato o a doppia solcatura (…) queste olle sembrano essere legate ad una tradizione formale e tecnologica 'locale' o 'regionale' pre-romana, che trova stringenti analogie con le produzioni di ceramica da fuoco distribuite lungo l'arco alpino occidentale e, viceversa, ha, allo stesso tempo, pochi contatti con i coevi repertori da cucina italici e mediterranei in genere*".

[24] See CORTI, TARPINI 1997, p. 121: "*D'altronde, proprio la vastità dell'area di diffusione presuppone una pluralità di centri di produzione, i quali sembrano rimanere legati a motivi decorativi riconducibili ad una comune tradizione preromana,*.

quite rare in more peripheral areas, like for examples in hill settlements located in nowadays Carnia[25].
Looking outside *Regio X* territories, this type, in both fabric variants, is attested from *Regio IX-Liguria* to *Regio VIII-Aemilia*; few samples have been found even in *Regio V-Picenum*.
Outside Italy's borders, *ollae 8* are also attested in nowadays Croatia and Slovenia, and sporadic samples have also been found in Northern France, in contexts dated to the Julio-Claudian age[26].
It has to be noticed that current research on this type mainly looked for comparisons only within a quite restricted area, more or less coinciding with the administrative borders of the modern Italian regions.
It is worthy to mention here some of these studies, since they constituted the starting point for the present research.
A quite complete list of attestations of these *ollae* in nowadays Lombardy can be found in the publication *Ceramiche in Lombardia*, where *cavetto rim ollae* are called *ollae n. 56*. The list of comparisons attested for the type indicates a chronology between the 1st and the 4th century AD, with a peak of attestation between the 1st and the beginning of 3rd century AD[27].
This same chronology, with fewer attestations in the 4th century AD, is also shared with several samples found in modern Piedmont, mentioned by A. Gabucci in her publication of the roman necropolis of Almese[28].
Many studies focused their attention on *ollae 8* found in several sites in nowadays Liguria, where productive places have been identified also through archaeometric analysis[29].
A brief summary of samples collected in modern Emilia Romagna is already contained in D. Labate typology of coarse ware collected in this

[25] For the list of comparisons both within *Regio X* and beyond see the *Appendix I,* Table 4: *Ollae 8*, pp. xxv-xxxvii, completed by the distribution maps of *ollae 8* within *Regio X* in *Appendix II,* pp. l-li.
[26] VENTURA, CIVIDINI 2007 p. 228.
[27] *Ceramiche in Lombardia*, p.152, olla n. 56, Tav. LX, 1-4.
[28] See GABUCCI 1996, p. 76 and mentioned bibliography.
[29] See CAGNANA 1994, pp. 114-115 for a first list also containing cross references to previously published bibliography. A more recent and updated distribution map of these *ollae* in modern Liguria is contained in BULGARELLI, TORRE 2004, p. 74.

region[30], while a quite recent publication of coarse ware collected during surveys in the *ager Firmanus*, in nowadays Marche, make some references to other samples collected within this region, both in settlements and in necropolis, as well as from ploughsoil assemblages[31].
This tradition of studies that remained linked with the modern administrative borders, has so far hindered the possibility to truly appreciate the widespread presence of these *ollae* in a broader territory.
The present research, mapping the published samples without any geographical limitations, enabled to appreciate that *ollae 8* have been found in a very broad area, comprehending the entire Po plain, with extensions in the whole Northern Adriatic arch.
It is however more difficult to explain the reasons behind this wide area of attestation; indeed it is still not clear whether *ollae 8* were produced in few productive centres, located in central towns well linked with the Roman networks of commercial routes, or if they have been produced independently by different pottery workshops, that maintained the same features because of the same cultural background[32].
Modern archaeometric approaches so far brought evidences for both the explanations.
Unlike other coarse wares, *ollae 8* have interested archaeometry as early as the nineteen nineties; petrographic and chemical characterisations of these *ollae* enabled to identify different productive centres.
The main results confirmed what was already supposed looking at the distribution of the type, i.e. that some *ollae 8* pottery workshops should be located within the border of *Regio IX-Liguria*.
While at the beginning of the research a production of these *ollae* was located only in the hinterland of *Vada Sabatia*/Vado Ligure[33], developments in archaeometric analysis and in material characterisations enabled to further articulate the productive areas.

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[30] See LABATE 1988, pp. 62-64, olle RT I B, fig. 35.
[31] MENCHELLI *et Alii* 2010, p. 246, fig. 7, 29-31.
[32] DELLA PORTA, SFREDDA 1996, p. 150.
[33] This hypothesis was firstly proposed for the materials found in the votive deposit of Caprauna, on the basis of some petroghraphical elements typical of this area recognised through macroscopical observation. See CAGNANA 1994, p. 115, note 49 and mentioned bibliography.

Nowadays, on the basis of clay features, three different places where *ollae 8* were produced have been recognised within the modern Western Liguria:
- several workshops should have been located on the coast, in the territory between Vado Ligure e Pietra Ligure;
- a single workshop seems to have been identified in the western zone of Savona, near the mouth of *Quiliano* river;
- a number of workshops were active in the area between Albisola and Genua[34].
One of the earliest workshops that produced *ollae 8* is located in *Regio XI*, and it was identified in the nineteen eighties, on the basis of archaeological evidences. It is located in the *villa rustica* unearthed at Caselette (TO), where un-fired *ollae 8*, both decorated and plain, have been found[35].
Microscopic observations of thin sections and petrographic characterisation enabled to identify as local products some *ollae 8* collected during the excavations of *Luni*. Here *ollae* belonging to this type are attested also in later layers and they have been assigned to *gruppo 33b*, comprehending mostly materials produced with local clays[36].
Quite recent excavations in the pottery kiln discovered in Cavigliano - Bellinzago, brought to light several *ollae* belonging to this type, thus bringing clear evidences that they have been produced also outside the territories previously recognised as productive centres[37].
The presence of trachyte from the Euganean hills enabled to identify as local productions some *ollae 8* collected in the pottery workshop unearthed during the excavations in Via Neroniana at Montegrotto Terme[38], thus suggesting the existence of a productive centre also within *Regio X*.

[34] For the detailed description of the three fabrics see BULGARELLI, GERVASINI *et Alii* 2011, pp. 126-128.
[35] REBAUDO GRECO 1980, p. 135, note 3.
[36] *Luni I*, p. 135; *Luni II*, p. 622.
[37] For a brief description of the excavation and the materials discovered there, see POLETTI 2006.
[38] MARITAN, MAZZOLI *et Alii* 2006, pp. 257-258.

A further hint in this direction came from the *ollae* unearthed in the settlement of Neblo Borg, at the Eastern fringe of *Regio X*, whose archaeometric characterisation enabled to identify *ollae 8* unearthed here as local production, from prototypes commonly spread in Northern Italy[39].

It is even possible to locate a Southern production in Fermo, in the *Regio V-Picenum*, on the basis of the widespread presence of *ollae 8* both in settlements and necropolis, that could be hardly explained as the results of trades[40].

It is likely that further development of the research will enable, in the future, the identification of others *ollae 8* productive places; so far, this list seems to be enough to confirm, as already suggested in the nineteen nineties, the existence of several, high quality, pottery workshops that used to locally produce similar materials in different centres scattered all over Northern Italy[41].

Archaeometric analysis further confirm that within the wide territory where *ollae 8* are spread, several pottery workshops, located in different areas, used to produce at the same time, likely in an autonomous way, vases morphologically very similar to each other and that furthermore preserved decorative motives and patterns that derived from the common, pre-Roman *substratum*[42].

The reproduction of the same shape in such a wide territory could be read either as a first evidence of a local production that took inspiration from foreign models or as a further proof of the presence of itinerant artisans, who brought their *repertoire* to the their new work place.

It is important to stress here that archaeometric analysis both confirmed the existence of several local productions and testified for the trade of these *ollae*, even over medium-long distances[43].

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[39] VIDRIH-PERKO, ŽUPANČIĆ 2011, p. 158.

[40] MENCHELLI *et Alii* 2010, p. 246.

[41] This hypothesis was firstly proposed by L. Vaschetti, on the basis of the wide presence of these *ollae* that, according to him, couldn't be explained only in terms of trade and transportation of the vases. See VASCHETTI 1996, p. 179, note 23.

[42] BULGARELLI, GERVASINI *et Alii* 2011, p. 130.

[43] For example, from the North-Western alpine region to the *Regio X* flatlands for some samples from Montegrotto Terme - via Neroniana.

Petrographic characterisation widely demonstrated that some samples of *ollae 8* unearthed in different sites within Modena territory, as well as some sherds unearthed in the *villa rustica* of Chiunsano, were produced in the western Alpine territories, in an area more or less coinciding with the North-Western part of modern Piedmont, unfortunately without any possibility to further narrow the provenance zone[44].
Furthermore, a provenance from the Apennine areas, between nowadays Liguria and Toscana, was suggested for sherds unearthed in the settlement of *Bedriacum*/Calvatone[45].
Archaeometric characterisation enabled to recognise as allochthonous products also some *ollae 8* unearthed in Montegrotto Terme, within the same site in via Neroniana, where also locally produced *olle a orlo modanato* have been identified[46].
Evidences from this pottery workshop turned out to be of high importance since they testify that *ollae 8* locally produced and imported from other places could exist simultaneously in the same site.
This co-presence could be read as a first evidence of a local production that took inspiration from foreign models; another *phenomenon* that needs to be considered in approaching this situation is the nowadays well-known recognised existence, also during Roman times, of itinerants artisans, who are likely to bring with themselves foreign models and to reproduce them also in the arrival places.
Since local productions were possible, it is likely that *ollae 8* were traded not for some peculiar technological features, but as containers of perishable goods, preservable for quite long periods of time.
It is highly probable that, after having worked as transport containers, they were then re-used in everyday life, as storage and cooking vessels, since their morphological features made them suitable for multiple purposes and their technological characteristics enabled them to bear thermal shocks and thus to be used over the fire.

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[44] For materials from Modena territories, see CORTI, TARPINI 2012, pp. 138-139, while the provenance of sherds unearthed in Chiunsano is explained in CORTI 2016, p. 98. The most recent summary in favour of the circulation of these *ollae* could be read in GABUCCI 2018, p. 292

[45] Results of the archaeometric analysis performed on *ollae* of this kind unearthed in Calvatone are discussed in DELLA PORTA, SFREDDA 1993, p. 94.

[46] MARITAN, MAZZOLI *et Alii* 2006, pp. 257-258.

Ollae 8 are thus a tangible proof that coarse ware was traded even over long distances; furthermore, the fact that they are not high-technological products, and that similar *ollae* were also locally made, support the hypothesis that they circulated mainly as food containers. They did not represent the main merchandise but they should be considered a complementary object of trade, to fill up wagons or ships. Their widespread circulation, indirectly testifies for the richness and the dynamicity of trade within Northern Italy territories, especially in the first centuries of the Empire, when this kind of *ollae* were mainly used and spread[47].

The broad diffusion of these *ollae*, and the fact that they were locally produced always with the same morphological and technological features, could be also explained taking into consideration that this peculiar shape could became, over the years, strongly linked with a specific function and/or a specific content; the *ollae* turn into a kind of highly recognisable marker.

Morphological and technological features were preserved over a long period, and were precisely reproduced, almost with no variations, in different workshops (that on the other hand used local raw materials), possibly because these features immediately suggested the function of the vase and/or the specific food it used to contain.

Since, as mentioned before, vases of this type could have worked both as storage and cooking vessels, as well as funerary objects, it is more likely that their shape was commonly associated to a specific content.

The peculiar features were preserved since they immediately conveyed an information about the contents, and this turned out to be particularly useful especially for vases used as transport containers,

[47]See CORTI, TARPINI 2012, pp. 138-139: "*Il dato della provenienza in sé risulta comunque di primaria importanza, testimoniando la presenza di quantitativi consistenti di ceramica da cucina prodotta non localmente e distribuita su medio-lunghe distanze. Vista l'origine alpina dell'argilla, si tratta di una distribuzione che deve aver sfruttato appieno l'articolata rete fluviale incentrata sul fiume Po. Questa circolazione, interessando una merce 'accessoria', che generalmente non costituisce l'oggetto primario del commercio, appare inoltre come un importante indicatore dello stato e intensità dei traffici durante la prima e media età imperiale*".

since they were closed during the trade. In other words, the vessel shape in itself provided information on what was inside the vessel[48].
At the current state of the research it is thus likely that this kind of *ollae* were traded as food containers and that they were distributed over medium-long distances, thus reaching a broad territory, comprehending more or less the entire Northern Italy.
Looking at their distribution[49], samples were found along two main routes belonging to the Roman integrated commercial network.
Finds are concentrated along the *via Postumia*, the great consular road that used to connect Genua to Aquileia, and its tributary roads.
The use of the *Via Postumia* as a main commercial route could also explain the peculiar distribution of *ollae 8* within the *Regio X*; the most accepted reconstruction suggests that these vases arrived at the final destination of the consular road, Aquileia, that worked as distribution centre, spreading these materials within its *ager*, exploiting the network of secondary roads and minor natural rivers and manmade canals that further connected the city with the other territories of Northern Adriatic arch.
Furthermore, *ollae 8* were also found in several sites located along the river Po, further suggesting the importance of this watercourse for inland trades.
Ollae 8 distribution could be read as a further proof of the integration, within the same trade system, of both terrestrial roads and inland waterways, that could also be observed looking at the *Stella/Anaxum* basin.
Despite the nowadays quite long tradition of research enabled to retrieve from this kind of *ollae* countless information, many questions regarding their production and circulation still remain open.
Indeed it is still not clear where the prototypes firstly originated and where they started to be firstly produced within the diffusion area; also

[48] Despite most recent studies are now demonstrating ample possibilities of a reuse of amphorae, these vases still represent the iconic model for this strict relationship between vessel shape and content; indeed we still distinguish among amphorae that used to carry wine, from those dedicated to the trade of oil, and those used to transport *garum*.
[49] See the distribution map of *ollae 8* in Northern Italy presented in *Appendix II*, p. li.

the link with a specific content still needs to be defined as well as a their preferential routes are still waiting for a final delineation.
However, if so far their diffusion in the entire Northern Italian area was not completely addressed[50], the list of attestations, as well as the distribution maps presented in the *Appendix*, are a first step toward a better comprehension of the distribution and diffusion of these *ollae* within Northern Italian territories. The connection spotted between the sites of attestations and the main trade routes should be further investigated, but it is a clear hint of the use of *ollae 8* as transport containers, thus clearly defining their importance in reconstructing the system of trade and distribution of coarse ware within a quite broad area, overcoming the idea that these vases were not trade across local or regional borders.
Looking more closely at *ollae 8* found at the *Stella 1* site, they are 35 fragments, belonging to 22 individuals, equally distributed in the two variants, each one comprehending eleven samples.
The peculiar fabric and morphological characteristics enabled to recognise as belonging to this type also some otherwise non-diagnostic pieces, such as some simple, flat bases.
Small, medium and large size *ollae* are represented but small size *ollae* are predominant (see the graph in *figure 29*).
The only almost entirely preserved sample, V212/AP474+AP521, is a small size *olla* with a peculiar plain rim.
It represents a minor variation within the type, already attested in literature, where smaller *ollae*, that reproduced more simply the morphology of complex *olle a orlo modanato*, are usually considered together with the last ones[51].
V212/AP474+AP521 carrying capacity has been calculated in 0,75 Litres, i.e. 1,37 *sextarii* = 2,74 *heminae*.

[50] See BULGARELLI, TORRE 2004, p. 76: *"Resta da definire l'origine del prototipo e della produzione, la diffusione in area transalpina che non ancora è stata perfettamente enucleata, la composizione di eventuali batterie da cucina pertinente alla classe"*.
[51] BULGARELLI, TORRE 2004, p. 78 remembers that this smaller *ollae* reproduced the shape of the bigger *urne a bordo sagomato*, stating that already N. Lamboglia, in his publication of materials from Ventimiglia - *Albintimilium*, considered the two variants together, identifying in the smaller vases a *replica* of the bigger ones.

Nevertheless, it remains so far an isolated sample, since all the other *ollae 8* sherds belong to different sizes and show diameters different from each other.

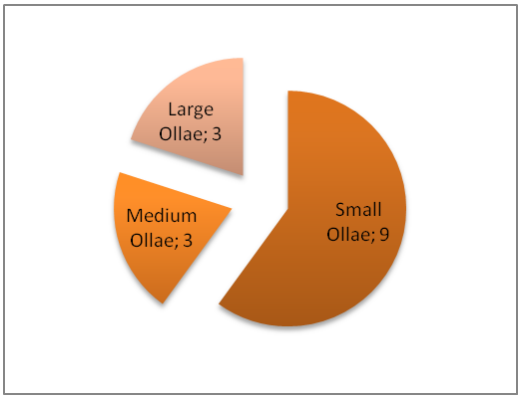

Fig. 29. Stella 1, Ollae 8. *Sizes*

Ollae 8 from the *Stella 1* site represent a quite homogeneous group, and it is likely that they belong to the ship(s)'s cargo.

A further hint towards this interpretation could be found thinking about the general chronology of the type; as stated above, *olle 8* were attested for a long period. However they reached their widest diffusion especially during the 1st - 2nd century AD, a chronology that fits with the overall dating of the site.

Ollae 8 are quite interesting also focusing on their relationship with the other *Stella 1* coarse ware types.

Indeed, as it is immediately clear comparing the two distribution maps, *ollae 8* and *ollae 1*, occurring together at *Stella 1*, were found associated also in different sites all over Northern Italy[52].

Both shapes were produced in at least two fabric variants, a coarser and an almost depurated one; both *ollae 1* and *ollae 8* were popular during the 1st -2nd century AD, and remained in use until the 4th AD. Finally, *ollae 1* were supposed to be produced in North-Western alpine territories[53], where also a production of *ollae 8* is attested. It is likely that at least at the beginning of their diffusion, *ollae 1* and *ollae 8* started to be produced in one, or more, centre(s) located in the Western Alpine

[52] The association of *olle a orlo modanato* and *ollae* with prominent shoulder in different sites located in North-Western Italy has already been noticed by Garanzini and Quercia in their work about coarse ware from Piedmont (see GARANZINI, QUERCIA 2016, p. 260).

[53] See above, chapter 6.1.1 *Ollae 1*, pp. 143-179.

territories. From there, they spread throughout Northern Italy exploiting the complex network of Roman roads and inner waterways, especially the great route represented by the river Po. It seems that in both cases, soon after the first appearance of the type, local potters started their own production, maintaining almost unchanged morphological and technological features.

The high conservationism could be explained because of a strong relationship between the vessel shape and its content, immediately recognisable within a broad territory.

Two possible explanations are valid: either the manufacture of the content was equally decentralised or the content was firstly transported in larger perishable containers and then refilled in *ollae 8* for local trade and consumption. In this case the containers had to be identical in all the distribution area, as an unspoken indication of the content. The shape was produced with only slight changes over a long period in different regional workshops because producers, tradesmen, as well as consumers, associated the shape with the content, as in the case of amphorae[54].

As already known for *Auerberg* pots[55], both *ollae 1* and *ollae 8* and their association, confirm that coarse ware was used as food container over trans-regional, long distances trade. Broadening the sight, *ollae 8*, and their association with *ollae 1*, give insights in exchange and river trade over medium-long distances in early Imperial period.

With the caution due when facing this kind of materials[56], the presence of *ollae 8* within *Stella 1* materials, when compared with their spread in the lower Friuli plain and with their possible provenance from North-Western Italy, is a sign of economic dynamicity of the *Stella*/*Anaxum* basin.

Preferential trading routes were already in use during early Imperial age, but they were not restricted to the main roads; the capillarity of the

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[54] Despite most recent studies are now demonstrating ample possibilities of a reuse of amphorae, these vases still represent the iconic model for this strict relationship between vessel shape and content; we still distinguish among amphorae that used to carry wine, from the ones dedicated to the trade of oil, and the ones used to transport *garum*.

[55] See below, chapter 6.1.9, *Ollae 9*, pp. 289-304.

[56] In dealing with shapes attested in such a broad territory, it is needed to focus the attention mainly on diversities than on similarities.

Roman integrated trade system enable the penetration of both big and small markets. North Eastern Italy was completely integrated, already in early Imperial period, in commercial trades also over medium-long distances, whose liveliness is further reinforced by the fact that these trades also involved secondary goods such as coarse ware, normally considered a poor material, or, even better, the foodstuff contained in these vases.

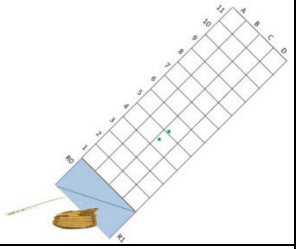
Notwithstanding, the considerations so far presented are enough to prove that these *ollae* testify for long distance trades, and that further research are deemed necessary to completely unlock their informative potential.

Ollae 8a

Catalogue number	V192
Inventory number	AP699
Graphic/Photographic Documentation	Pl. XVIII, Fig. 66
Provenance	D5 Beta 5
Description	Very small fragment of thickened *cavetto* rim. The edge is flatten, the cordon is well defined. The prominent shoulder bears a simple decoration.
Decoration	Single row of slightly oblique oval notches, obtained removing small portions of clay from the surface.
Dimension	Rim diameter: 22,6 cm Bottom diameter: --- Maximum height: 2,6 cm Maximum thickness: 0,9 cm
Production techniques	Horizontal striations visible on both surface suggest that the vessel has been wheel-thrown.
Usage marks	None

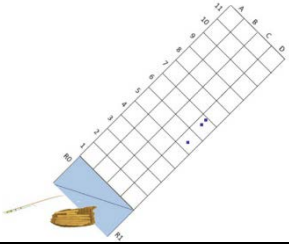
Catalogue number	V194
Inventory number	AP394
Graphic/Photographic Documentation	Pl. XVIII, Fig. 67 Pl.VI, Fig. 21 (Photo)
Provenance	C4
Description	Fragment of the upper part of a globular *olla*. The rim, slightly thickened, has a flat edge and it has a square-shape profile. The clay cordon below the rim has a square profile as well. The prominent shoulder is characterised by a simple decoration.
Decoration	Single row of slightly oblique oval notches, obtained removing small portions of clay from the surface.
Dimension	Rim diameter: 14, 4 cm Bottom diameter: --- Maximum height: 5,9 cm Maximum thickness: 0,8 cm
Production techniques	Wheel-thrown as suggested by the very smoothed surface and by the regular thickness of the walls.
Usage marks	None

Catalogue number	V197
Inventory number	AP67+AP124+AP69
Graphic/Photographic Documentation	Pl. XVIII, Fig. 68 Pl. VI, Fig. 22 (Photo)
Provenance	AP67: D2 Alpha 5 AP69: D2 Alpha 3 AP124: D2 Alpha 2
Description	Three non-matching fragments of the same globular *olla*. The vase is characterised by a *cavetto* thickened rim with flat edge, cut obliquely toward the outside. The decorated neck is preceded by a well-defined clay cordon, with semicircular section.
Decoration	Single rouletting line, with two patterns: decorative motive are mainly vertical rectangular notches alternate, at almost regular distance, with a geometric composition. This last one is formed of four triangles with centred vertices, creating a square separated along its diagonals.
Dimension	Rim diameter: 17,6 cm Bottom diameter: --- Maximum height: ,9 cm Maximum thickness: 1 cm
Production techniques	The regular thickness of the walls and the faint horizontal striations visible mainly on the inner surface testify for a wheel production.
Usage marks	None

Catalogue number	V206
Inventory number	AP393+AP766
Graphic/Photographic Documentation	Pl. XVIII, Fig. 69
Provenance	AP393: C4 AP 766: C5 
Description	Little fragment of *cavetto* rim, thickened in the upper part and with a rounded edge. Between the rim and the decorated shoulder there is a well-defined, semicircular cordon.
Decoration	Very inclined oblique incised lines, thin and with irregular borders, on the shoulder, at the point of maximum expansion.
Dimension	Rim diameter: 14 cm Bottom diameter: --- Maximum height: 3,3 cm Maximum thickness: 0,9 cm
Production techniques	Faint horizontal striations visible on both surfaces testify for a wheel production.
Usage marks	None

V198/AP134, V199/AP224 and V200/AP574 belong as well to this variant.

Fabric and morphological features enable to identify as belonging to this variant also some bases.

Catalogue number	V211
Inventory number	AP726+AP888+AP1692
Graphic/Photographic Documentation	Pl. XVIII, Fig. 70
Provenance	AP726: D5 Beta 4 AP888: D6 Gamma 1 AP1692: D6 Alpha 1 
Description	Entirely recomposed flat base, belonging to a globular *olla*. The walls make a concave entry with the body, meeting the base almost vertically at the attachment point. This results, on the outer surface, in a little shrinking just before the base.
Dimension	Rim diameter: --- Bottom diameter: 9,6 cm Maximum height: 5,6 cm Maximum thickness: 1,2 cm
Production techniques	Wheel-thrown as suggested by a variety of features, such as the faint horizontal striations on the outer surface, the string cut on the underside of the base and the sandy grains that would have helped the detachment of the vase from the wheel.
Usage marks	Faint burn marks on the outer surface.

The bases V209/AP395 and V210/AP7+AP60 ,as well as a side belonging to a globular body, V208/ AP2 are *ollae 8a* as well.

Ollae 8b

Catalogue number	V191
Inventory number	AP213
Graphic/Photographic Documentation	Pl. XIX, Fig. 71
Provenance	C3 Alpha 2
Description	Fragment of thickened rim with *cavetto* profile. The edge is obliquely cut towards the outside. The passage rim-shoulder is underlined by a small cay cordon, ending in a quite deep groove. The shoulder, prominent, bears a simple decoration.
Decoration	Parallel oblique lines with irregular borders, incised with a non-sharp instrument.
Dimension	Rim diameter: 12 cm Bottom diameter: --- Maximum height: 5,9 cm Maximum thickness: 0,9 cm
Production techniques	Wheel marks visible on both surfaces suggest that the vase has been wheel-thrown.
Usage marks	None

Catalogue number	V195
Inventory number	AP1412
Graphic/Photographic Documentation	Pl. XIX, Fig. 72 Pl. VI, Fig. 23 (Photo)
Provenance	C8
Description	Fragment of slightly thickened *cavetto* rim, with flatten edge, obliquely cut toward the outside. Below the rim, a semicircular clay cordon is underlined by two grooves. Globular body with slightly pronounced, decorated shoulder.
Decoration	Single row of irregular rectangular notches (roulette?).
Dimension	Rim diameter: 22,4 cm Bottom diameter: --- Maximum height: 8,7 cm Maximum thickness: 1 cm
Production techniques	Faint horizontal striations, mainly of the outer surface, suggest that the vessel has been wheel-thrown.
Usage marks	None

Catalogue number	V201
Inventory number	AP742+AP834
Graphic/Photographic Documentation	Pl. XIX, Fig. 73 Pl. VII, Fig. 24 (Photo)
Provenance	C5
Description	Fragment of globular *olla* with thickened *cavetto* rim. The edge is flatten, obliquely cut toward the outside. Under the rim a slightly deep groove precedes a semicircular clay cordon. The shoulder is decorated.
Decoration	Single row of oblique, ovaloid notches, probably incised, at the point of maximum expansion of the body.
Dimension	Rim diameter: 22 cm Bottom diameter: --- Maximum height: 11 cm Maximum thickness: 0,9 cm
Production techniques	Wheel-thrown, as suggested by the faint horizontal striations perpendicular to the height of the vessel, visible on the interior surface.
Usage marks	Burn marks scattered all over on the exterior surface.

Catalogue number	V202
Inventory number	AP1327
Graphic/Photographic Documentation	Pl. XX, Fig. 74
Provenance	B8 Epsilon 5
Description	Very tiny fragment of *cavetto* rim with flatten edge, obliquely cut towards the outside. Small, circular clay cordon below the rim underlined by two small groove. The body is not preserved.
Dimension	Rim diameter: 17 cm Bottom diameter: --- Maximum height: 2,3 cm Maximum thickness: 1 cm
Production techniques	Wheel-marks visible on both surfaces testify for a wheel-production.
Usage marks	Faint burn marks on both surfaces.

Catalogue number	V205
Inventory number	AP791
Graphic/Photographic Documentation	Pl. XX, Fig. 75
Provenance	C5
Description	Fragment of a globular *olla*. Thickened *cavetto* rim, with a flat edge and a square profile. Square-section clay cordon between the rim and the prominent, decorated, shoulder.
Decoration	Single row of almost quadrangular incised notches on the shoulder.
Dimension	Rim diameter: 14,6 cm Bottom diameter: --- Maximum height: 8,2 cm Maximum thickness: 0,8 cm
Production techniques	Regular thickness of the walls and wheel-marks on the interior surface suggest that the vessel was wheel-thrown.
Usage marks	Burn marks scattered all over on both surface; however, they are possibly the result of uneven firing conditions.

Catalogue number	V212
Inventory number	AP474+AP521
Graphic/Photographic Documentation	Pl. XX, Fig. 76 Pl. VII, Fig. 25 (Photo)
Provenance	R0
Description	Almost entirely reconstructed small globular *olla*. Slightly thickened rim with round edge. Prominent shoulder and Thinned flat base.
Dimension	Rim diameter: 11,4 cm Bottom diameter: 6 cm Maximum height: 6,6 cm Maximum thickness: 0,7 cm
Production techniques	Wheel ridging visible on the inner side and string-cut marks on the underside of the base suggest that the vase was wheel-thrown.
Usage marks	None

V193/AP16; V203/AP824; V204/AP146 and V207/AP944 belong to this variant. Their poorly preservation state prevent to provide both a graphic representation and a dedicated catalogue card.

6.1.9 *Ollae 9/Auerberg ollae*

This group has been created despite it is attested within *Stella 1* coarse ware by only one fragment of *olla* (see *figure 30*) and few other tiny fragments; however, its peculiar fabric and morphological features enabled to immediately identify it as belonging to a type wide spread within *Regio X* borders and now object of a quite long tradition of studies: the *Auerbergtöpfen/ollae Auerberg*.

Fig. 30. Stella 1.*The fragment of* Auerberg olla V213/*AP196*

The identification of this peculiar productions lead to considered within this type also two fragments belonging to two beakers, one rim and one base; their morphological and technological characteristics enabled to relate them to *Auerberg* vases that are attested from small beakers to large *dolia*, as it is going to be explained below.
The name *Auerbergtöpfen* derives from the Roman settlement on the Auerberg, in nowadays Weilheim-Schongau district (Southern Bavaria, Germany), where several samples were recognised as a homogenous group and were firstly described at the beginning of the 20th century by J. Jacob[1]. However, the definition of *Auerbergtöpfen/Auerberg ollae* arrived later, thanks to G. Ulbert's work on Lorenzberg pottery[2].

[1] FRANK, JACOBS 1907, 80f.
[2] See ULBERT 1965, pp. 87-91. A detailed reconstruction of the history of scientific research on these *ollae* could be read in SCHINDLER KAUDELKA, ZABEHLICKY-SCHEFFENEGGER 2007.

Auerberg ollae found on the eponym settlement are characterised by a black colour and a greasy-feeling surface. They are slim, medium size pot, well recognisable for their almond-shaped rim.
During more than one century of research, a large number of vessels has been published under this denomination, without really belonging to the class, since they are characterised by slightly different morphological, technological and dimensional features. As a result, they also have different chronology, provenance and functional destinations[3].
The state of the art makes a difference between four different kind of vases that, despite sharing a common prototype, have been found in different sizes and proportions. The oldest shapes, generally used as storage pots, show a vessel inscribed in a cube, while their successors, with a shape inscribed in a rectangular block, evolved from larger multifunctional pots to smaller cooking pots. Most of these bear a combed decoration, while the smallest of the group, the genuine so-called *black Auerberg*, are usually plain.
Ollae Auerberg were fired at relative low temperature, between 6/700° C, in reducing atmosphere, resulting in a dark colour both on the surface and in the core, ranging from dark grey to black. Early samples can rarely be light grey.
Produced in series, they are attested in several sizes, ranging from small beakers to large size *ollae*. A high level of standardization is attested only for cooking pots and transport containers from late Augustan time onward; all the other vessels, while maintaining the same formal characteristics, change seamlessly from large *dolia* to small beakers (see *figure 31*).
The most meaningful and recognizable feature of this kind of *ollae* is the almond shaped rim, ending in a groove. It is a feature adapted to sealing the vessels with pieces of fabric or leather, held tight by a string, further inserted into the folded profile, thus suggesting that *Auerberg ollae* were primarily used as storage containers for perishable goods.

[3] SCHINDLER KAUDELKA, ZABEHLICKY-SCHEFFENEGGER 2007, p. 226.

Fig. 31. Ollae Auerberg *produced in different sizes from the Basaldella necropolis.*
(From DONAT, MAGGI *et Alii* 2007, *fig. 8, p. 170*)

A further hint in this direction could be found in the great thickness of these vases, that would have ensured them a long life, improving their resistance to mechanical stress.

Furthermore, a now quite long tradition of research, further proved by modern archaeometric analysis, widely demonstrated that the black *Auerbergtöpfen* collected in several hill settlements and characterised by a greasy-feeling surface, i.e. the vases that share all the technological and morphological features with the Auerberg samples, were used to contain dried canned meat[4].

Gas chromatographic analysis showed that the greasy-feeling surface of the black Auerberg ceramics is mutton fat; since in several hill settlements *Auerberg ollae* occur together with animal bones, this circumstance suggests that it is highly likely that they were used to contain and trade sheep and/or goat meat, conserved in fat; the fat would have preserved the meat but at the same time it would have soaked the whole vessel, becoming responsible of the greasy-feeling surface.

Ovines grazing on Alpine slopes were slaughtered and preserved right in the breeding zone. Dried canned meat conserved in fat was shipped in black *Auerberg* pots and distributed to consumers in broad territory,

[4]At the beginning, a further hypothesis was proposed, i.e. that Auerberg *ollae* contained tallow, used for lighting in Roman times. However, a better contextualization of the vases enabled to clearly define the content. See DONAT, MAGGI *et Alii* 2007, pp. 158-159.

comprehending South-*Retia* and Northern *Regio X*, exploiting the *via Julia Augusta* and the road that used to connect *Iulium Carnicum* with *Auguntum*[5].

As a result, at least this kind of production is linked with the alpine sheep/goat farming in Northern *Regio X*, further confirming the key role of coarse ware in providing insights into the complex economic system of this border area, located between North-Eastern Italy and the neighbouring *Noricum*.

However it has to be acknowledge that progresses in archaeometric analysis also clearly demonstrated that, despite their traditional names, *Auerberg ollae* have not been produced in the Tiberian settlement in Bavaria. Indeed chemical composition of *Auerberg* pots found on the eponym settlement was compared to pottery locally produced on the Auerberg, structural part of a pottery kiln and to raw clay deposits located around the settlement. Results showed that black *Auerbergtöpfen* chemical composition have no resemblance neither with the local pottery nor with clays used in Roman times; for all these reasons they should be considered an import commodity[6].

Furthermore, it is now possible, thanks to the application of a combination of the most recent archaeometric techniques, to recognised that under the label *Auerberg ollae* have been gathered a variety of vases imitating the shape of the Auerberg pots, but locally produced at various sites, exploiting different raw materials.

Chemical and petrographic characterisations enabled to identify, within the broad group of so-called *Auerbergtöpfen*, several subgroups, each one characterised by different raw materials, and thus having different provenance[7].

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[5] Archaeozoological investigation clearly confirmed that some hill-settlements such as for example Raveo on Monte Sorantri or Invillino on Colle Santino, were butchery places located along the roads to accessible breading. For wide explanation of the *phenomenon*, see DONAT, FLÜGEL, PETRUCCI 2006, pp. 216-217.

[6] FLÜGEL, JOACHIMSKI, FLÜGEL 1997, p. 234.

[7] *Ollae Auerberg* from different sites within the distribution area have been analysed using thin sections, isotope analyses, neutron activation analysis, Mössbauer spectroscope, afterburning experiment and *X*-ray spectral analyses in order to clearly characterize their composition and thus to determine the provenance of their raw materials.

The recognition of several local productions delineates a quite complex situation, identifying, within the broad distribution area of these *ollae*, more delimited zones, each one characterised by the circulation of a peculiar production.

The black *Auerbergtöpfen* with greasy-feeling surface were realised with raw clay mixed with marble grains whose origin has been detected in Vipiteno/Sterzing or Gummmern. *Ollae* of this kind were produced on Alpine hilltop settlements and are attested in a quite wide area on both sides of the Alps; the settlement of *Auguntum* seems to be one of the most likely productive places for this kind of black *Auerberg ollae* realised adding Alpine marble to the raw clay[8].

A second production, characterised as well by marble inclusions, but with different provenance, is attested in two areas, the Southern *Noricum* and the territory of Aquileia and Cividale.

Samples from the Auerberg and the Magdalensberg, but mainly attested in the Friuli plain, realised with sandy clay, without adding any kind of marble to the raw material, testify for a third production[9].

The existence of several local productions that using different raw materials however preserved the same morphology and similar technology, could be read as a hint that *Auerberg ollae* were widely fashionable during the 1st century AD, fostering the activation of local productions that reached territories located far beyond the area where black *Auerbergtöpfen*, originally made on the hilltop settlements, were spread by means of trade.

The Alpine origin of the type seems to be further confirmed by the hypothesis that *Auerberg ollae* derive from the ever present Latenian *Graphittonkeramik*, i.e. the pottery whose raw clay was mixed with graphite in order to improve their thermal resistance. *Ollae* of this kind stopped to be produced in the third quarter of the 1st century BC when, for reasons that are still to be determined, graphite went low on the

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These complex and composite archaeometric approach the investigation of this pottery production is widely explained in FLÜGEL *et Alii* 2004 while the results are thoroughly discussed in DONAT, FLÜGEL, PETRUCCI 2006.

[8] FLÜGEL 2015, p. 387.

[9] For the detailed description of this ceramic fabrics, some of them further divided into subgroups that testify for multiple local productions, see DONAT, MAGGI *et Alii* 2007, pp. 152- 154.

market[10]. During this period potters switched to tempering clay with marble rubbish from local stone cutters workshops and, from the second half of the 1st century BC, started to produced the first *Auerberg ollae*.

Auerbergtöpfen were mostly used during the Julio-Claudian period but their life-time lasted for only one century, following a typological and functional evolution.

As suggested by finds from a number of contemporary sites, the evolution from the large chubby multifunctional pot to the slim small-sized food container took place in the Augustan age. In early Tiberian times this shape was fully standardized, while larger vessels with almond shaped rim still continued to be made for different purposes. Already during the Flavian era they started becoming more rare. Production ceased in the late 1st century and later examples not go beyond the first third of 2nd century AD.

If black *Auerberg ollae* with greasy-feeling surface were mainly use as food containers for trade, as clearly demonstrated by archaeometric analysis, *ollae Auerberg* were also multi-functional vases, used for a variety of purposes. Furthermore, a single vase could have been recycled during its usually long life time, working for different functional destinations.

First samples, characterised by greater dimensions, were large size and thick containers, whose largest circumference was at the height of the shoulder; it is unlikely that they were used as cooking vessels, since they would have required too long time and too many timber consumption to reach the temperatures required for cooking foods.

Starting from Tiberian age, samples became thinner and elongated. Same samples bear burnt marks on the outer surface as well as colour changes on the triangular rim, resulting from the covering of the pot with a lid. They are clear evidences of the use of these *ollae* over the fire, as cooking pots.

Sherds and entirely preserved vases unearthed in several necropolis prove a re-use of *Auerbergtöpfen* for funerary purposes. Since no indicators of a production specific for this destination have so far been

[10] SCHINDLER KAUDELKA, ZABEHLICKY-SCHEFFENEGGER 2007, p. 229.

found, it should be supposed that this kind of vases were simply recycled for new purposes.

Ollae Auerberg were used mainly as cinerary urns, even if so far no clear relationship with deceased's age and/or sex has been observed, thus suggesting that their re-use was not linked to specific symbolic meaning[11]. Small and medium size *ollae* were also found inside the graves, sometimes in multiple samples, thus suggesting a further use as grave goods.

Since it would have been impossible to perform archaeometric analysis on all the samples attested within published bibliography, in mapping the geographical distribution of this kind of *ollae* the broad definition of *Auerbergtöpfen*, however widely accepted by current literature, has been used. This decision is further supported by the fact that *ollae Auerberg*, in their broad definition, represent a common *phenomenon* that highlights the cultural homogeneity of the North-Eastern area, even deepened by the Romanisation process.

The distribution maps presented in *Appendix II* and the relative considerations detailed in the next lines, should not be considered an exhaustive list of all the attestations of this kind of vessel. They should be approached as a picture of the current state of the research, thought the growing number of excavations, as well as the increasing publications of pottery finds, will hopefully complete the distribution maps in the next years.

Auerberg ollae resulted widespread in a broad territory, comprehending the *Regio X* and other Roman provinces over the Alps, i.e. in *Noricum*, *Raetia* and Western *Pannonia*[12]. Some samples were found also in modern Slovene and Croatia[13].

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[11] *Ollae Auerberg* have been reused as cinerary urns for both male and female deceased, as suggested by the other grave good elements found in association. A list of these vases unearthed in funerary context is provided in *Appendix I*, Table 5: *Ollae 9*, pp. xxxviii-xliv.

[12] For *Raetia* and *Noricum* is still valid the exhaustive synthesis provided in FLÜGEL, SCHINDLER KAUDELKA 1995.

[13] Since the growing number of *ollae Auerberg* attested in published bibliography, the general distribution maps that lists the attestations over the *Regio X* borders should not be considered an exhaustive summary, but a first graphic layout sufficient to prove the widespread diffusion of this type in a broad territory. (See *Appendix II*, p. liii).

They were traded not only along the main Roman roads, but also following secondary routes, as demonstrated by their capillary diffusion, that reached also small villages and remote farms, in *Regio X* as well as in the bordering *Noricum* and South *Pannonia.*

The growing numbers of publications involving also coarse ware demonstrated a frequent presence of these *ollae* within the territories of *Regio X* and a local production in several places has been already demonstrated by different kinds of evidences.

Scholars nowadays commonly acknowledge that a production of *Auerberg ollae* should be located within the *Stella/Anaxum* basin, in the already mentioned *villa rustica* identified in Flambruzzo, Loc. Il Bosco. The pottery productive facilities have been quite recently excavated and, despite their bad preservation conditions, a production of both bricks and pottery has however been recognised. Furthermore, the presence of a relatively high number of *Auerberg ollae*, some of them over-fired, produced in series, from small beakers to large *ollae*, has been interpreted as evidence of a local production[14]. A further hint in this direction is provided by the identification, thanks to aerial photography, of some artificial hollows, disposed in regular rows, in an area not too far from the *villa rustica*, that were interpreted as traces left by the activity of clay extraction[15].

Since a production of this kind of *ollae* within the pottery workshop of Locavaz located at the mouth of Timavo river, could considered possible anymore[16], the workshop of Flambruzzo remained the only *Auerberg ollae* productive place indentified on the ground within the lower Friuli plain.

However, other evidences enabled to locate within the area between the spring belt and the lagoons other pottery manufactures that produced sandy clay *Auerbergtöpfen*.

A peculiar characteristic of a restricted number of these products is the presence of a stamped mark on the outer side of the rim. Marks are attested in a quite restricted area between San Vito al Tagliamento e Cividale - *Forum Iulii* and they were in use for a very limited time-span,

[14] See CIVIDINI, DONAT *et Alii* 2006, pp. 30-31, fig. 3.

[15] MAGGI 2001, p. 69.

[16] Oral communication by dr. P. Ventura.

from the Augustan period to the end of the Julio-Claudian age. Stamps are composed alternatively by initials or by full names, sometimes in the complete form of the *tria nomina*, sometimes with abbreviations.
It is still not clear the meaning of these nominal stamps; however it is likely that they were linked to productive phases and to different moments of the work within the pottery workshop[17]. For this reason, looking at their distribution, it has been possible to further identified other likely productive areas of *Auerberg ollae*.
The concentration of *ollae Auerberg* with the stamp *TAPVRI* West of the river Tagliamento suggested that the pottery workshop that used to mark its *ollae* with that name should be located in this area; epigraphic considerations further pushed toward its localization in the area of San Vito al Tagliamento, where inscriptions with comparable letter features were found[18].
Ollae bearing the stamp *Q.VAL* were instead produced around nowadays Pozzuolo del Friuli, where several kilns have been identified during archaeological research; the area of Cividale - *Forum Iulii* produced instead *Auerberg ollae* marked *P.B.V.*[19].
Evidences so far collected thus confirmed that in the Aquileia's *ager* and surrounding territories are attested *Auerberg ollae* both locally produced and traded from the Alpine settlements; since in Aquileia these vases were not particularly appreciated (indeed very few samples have been so fare unearthed there, despite the role of the colony as central *emporium*) the co-presence within this area of different productions

[17] A detailed discussion about stamped marks on *Auerberg ollae*, completed by an updated catalogue of all the marks so far attested is contained in DONAT, MAGGI *et Alii* 2007, pp. 168-187, an exhaustive work widely consulted for the present research.
[18] BUORA 1984, c. 13. More recent research have identified within this area along the river at least two pottery workshops: one belongs to the *pars rustica* of the *villa* located in Gorgaz, at San Vito al Tagliamento, while the other is an isolated pottery workshop located at San Giovanni di Casarsa della Delizia. For a more detailed explanation, and for the relative bibliography, see DONAT, MAGGI *et Alii* 2007, p. 175, nota 125.
[19] DONAT, MAGGI *et Alii* 2007, pp. 173-178. These authors mentioned also two other marks, *RVFI* and *P.RAMAR*; since their productive places have not been identified yet, and since the focus here is not the mark in itself while as evidence of production, they will not be mentioned in the text, recalling to the reader the quoted work for any kind of in-depth analysis.

further testify the commercial dynamicity of the territories between the *risorgive* area and the Northern Adriatic arch.
As recalled several times, this area was well served by a complex network of terrestrial roads and waterways, that was surely exploited for the trade of *Auerbergtöpfen*; indeed, looking at their distribution, it is possibly to identify their preferential commercial routes.
This kind of *ollae* are widely attested primarily along the *Via Julia Augusta*, the main road heading North, that used to link Aquileia with settlements located in the *Noricum;* this path was surely followed by black *Auerbergtöpfen* with marble inclusions produced beyond the Alps, that firstly brought this shape also within *Regio X*, further confirming the derivation of this type from North-Alpine prototypes.
Samples are quite numerous also in the lower Friuli plain and the *Stella/Anaxum* basin turned out to be an area of high diffusion of these *ollae*. It has to be remembered once again that a pottery kiln that produced this kind of *ollae* was identified in Flambruzzo, Loc. Il Bosco, located nearby the river.
Another interesting consideration comes comparing the distribution maps of *ollae 7* and *ollae 9*; they were indeed found in association in several sites within Aquileia's *ager* and along the *Stella/Anaxum* watercourse.
This distribution turns out to be quite interesting since a production of both *ollae 7* and *ollae 9* is attested in the same pottery workshop located within the *villa rustica* of Flambruzzo, Loc. Il Bosco, more or less at the same time, since the two types share a similar chronology.
Further investigation will be necessary to clearly define the productive and distribution patterns of pottery produced within this workshop, and only archaeometric analysis will provide sure information; so far, it is worthy to notice that two types, clearly locally produced, were spread in a quite broad area, further confirming the efficiency of the integrated Roman routes system within the *Stella/Anaxum* basin and, more broadly, within lower Friuli plain.
Despite the broad diffusion of the type in this territory, that furthermore is one of the productive places of these *ollae*, *Auerbergtöpfen* are attested within *Stella 1* site by only one fragment of *ollae* and two fragments belonging to two beakers. Also within fragments collected

directly on the hull remains, *Auerbergtöpfen* were represented only by a restricted number of sherds[20].

It turns out to be extremely difficult to precisely identify to which of the above-mentioned productions could be related both the fragment of *ollae* and the base of the beaker collected on *Stella 1*. Indeed they are both extremely weathered due to the long permanence on the river bed; it is not clear whether the presence of several voids should be considered a primitive feature, or it is due to the post-depositional dissolution of some kind of inclusions. However, since grains of calcite and marble of different size could be easily detected both on the vessel surface and in the core, it is possible to exclude that they belong to sandy clay *Auerberg* production, otherwise common in the lower Friuli plain.

The beaker rim fragment presents features comparable to black *Auerberg* productions; it is indeed characterised by small and medium size, sparse, well-sorted inclusions, mainly consisting of sharp-edge white grains of calcite and quartz. The surface appears smoothed when rubbed with the thumb; this peculiar feature led to identify the fragment as a black-*Auerberg* since it seems to preserve, at least partially, the characteristics greasy-feeling surface.

However, for all the three cases, it is not possible to further identify the provenance of the fragments without the support of thin section and other archaeometric analysis.

The scarce presence of *Auerberg ollae* within *Stella 1* coarse ware is quite difficult to explain. A first possible reason lays in the fact that, looking at the distribution maps, these *ollae* seem to privilege terrestrial routes. However it should be reminded that the *villa rustica* of Flambruzzo, whose pottery kiln produced *Auerberg ollae*, was located in a favourable position especially because of its proximity to the river, that would have facilitated the trade of the produced goods.

Another possible explanation could be found on the chronological level. *Auerbergtöpfen* were mostly spread in the first half of the 1st century AD, and their production decreases from the Flavian age; on the other side, *Stella 1* chronology could be generally assessed from the second half of the 1st century AD.

[20] BRESSAN 1997, c. 450, fig. 4.

The scarce presence of *Auerberg* production can be thus linked with this slightly later chronology of the site. During the second half of the 1st century AD *Auerbergtöpfen* started disappearing; their low presence among *Stella 1* finds could be explained taking into consideration that the chronology of the archaeological deposit should be assessed at the end of the attestation period of this kind of productions, when they generally become more rare.

It is even more difficult to define the function of these vases within *Stella 1* pottery assemblage. They are a large size *ollae* and two beakers, no one entirely reconstructed and/or preserved, so that it is impossible to retrieve any further information from their dimensional relationship.

However it has to be noticed that the two beakers, since they are individual vessels, whose tiny dimensions enabled them to be hold in one hand, are likely not to be part of the cargo, but personal belongings of the crew members

It is more difficult to interpret the presence of the *olla;* being unique, it is hard to consider it as part of the cargo. It could be either part of the board equipment, maybe used to store some kind of food eaten by the crew, or a personal belonging of one of the crew members.

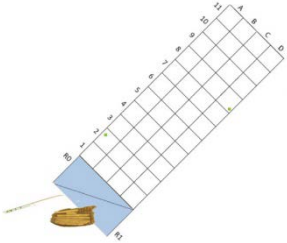
- Olla

Catalogue number	V213
Inventory number	AP196
Graphic/Photographic Documentation	Pl. XXI, Fig. 77 Pl. VII, Fig. 26 (Photo)
Provenance	C3 Delta 4
Description	Rim fragment of an *Auerberg olla*, characterised by a triangular profile rim, slightly thickened on the base and thinner on the upper part. Below the rim a shrinkage ended in a small semicircular clay cordon. The walls are almost vertical and the body is decorated.
Decoration	Multiple bundles of top arcuate combed stripes, starting on the shoulder, i.e. the vase's point of *maximum* expansions, and apparently continuing till the base.
Fabric	The ceramic surface appear quite smoothed when rubbed with the thumb. The fabric is characterised by medium size, sharp-edges, ill-sorted inclusions, consisting almost solely of white grains (either calcite or quartz). Inclusions have partly vanished, either during firing or more probably due to post-depositional weathering, leaving behind some well sorted voids with different shapes and sizes. Freshly broken sections are quite regular and walls are quite thin. The fragment is homogeneously black (both on the surface and in the core), suggesting regular reducing firing conditions.
Dimension	Rim diameter: 25 cm Bottom diameter: --- Maximum height: 17 cm Maximum thickness: 1,4 cm
Production techniques	The thin regular walls and the horizontal disposition of the inclusions suggest that the vase was wheel-thrown. The outer surface seems to have been smoothed on the wheel as well, possibly with a textile fabric.
Usage marks	None

- Beakers

Catalogue number	V223
Inventory number	AP820+AP821+AP825
Graphic/Photographic Documentation	Pl. XXI, Fig. 78 Pl. VII, Fig. 27 (Photo)
Provenance	C5
Description	Small beaker almost entirely reconstructed. Slightly thickened rim, almost triangular in shape. The passage from the rim and the ovoid, decorated body is underlined by a shrinkage.
Decoration	Bundles of combed lines. Three horizontal lines are immediately below the rim, at the point of maximum expansion. They are crossed, at quiet regular distance, by bundles of vertical lines that decorate the entire body.
Fabric	The fabric is characterised by small and medium size, sparse, well-sorted inclusions, mainly consisting of sharp-edge white grains, either calcite or quartz. The surface appear smoothed when rubbed with the thumb, likely a traces of the characteristic greasy-feeling surface Walls have an almost regular thickness of 0,8 centimetres. Also freshly broken fractures are quiet smooth, without evident irregularities. The colour of both the surface and the core is black, resulting from a regular reducing atmosphere during the firing.
Dimension	Rim diameter: 8,8 cm Bottom diameter: Maximum height: 8,4 cm Maximum thickness: 0,8 cm
Production techniques	The beaker is wheel-thrown. The outer surface appears burnished and it assumes a glistering aspects due to the regular disposition of the mica flakes.
Usage marks	None

Base fragments V255/AP28+AP1698 seems to belong to a beaker very similar to the one presented above. Indeed they share the same type of decoration, and the base shape is very similar to beakers entirely preserved comparable to V223/AP820+AP821+AP825. However, the fabric is quite different, hindering the possibility of considering the two pieces as belonging to the same vase.

Catalogue number	V225
Inventory number	AP28+AP1698
Graphic/Photographic Documentation	Pl. XXI, Fig. 79
Provenance	AP28: A2 Gamma 5 AP1698: D8/L 
Description	Two matching fragments of a flat base, joint to the vessel walls creating a slightly protruding foot. The preserved portion of the body is decorated.
Decoration	Single incised line at the joining point between the wall and the base, underlining the joining shrinkage. Bundles of vertical combed lines on the vessels walls.
Fabric	The main distinctive features of this fabric is the presence of many but sparse voids. They are mainly of medium and big size and characterised by sharp-edges. It is likely that they have been produced by the dissolution of some kind of inclusions, either during firing, or, more likely, because of post-depositional weathering. Also sharp-edges, medium size and quite frequent white grains are visible. The surface appears smoothed when rubbed with the thumb; walls seem to be quite regular, as well as freshly broken fractures. The colour ranges from dark grey to black. It is quite different among the two fragments, likely for slightly different post-depositional conditions.
Dimension	Rim diameter: --- Bottom diameter: 6,4 cm Maximum height: 2,6 cm

	Maximum thickness: 1,3 cm
Production techniques	The vase has been wheel-thrown as pointed out by the evident wheel-ridging on the inner side and by the string-cut marks on the underside of the bottom.
Usage marks	Inside, on the base, traces of a black substance, likely of organic nature.

6.1.10 *Ollae 10 – Varia*

This last type groups some fragments that do not fit in the previously described types for different reasons.
Two fragments stand out as *unica*; their characteristics were not comparable with vases so far described, and they are also completely different from each other for both fabric and morphological features.
For each of them it has been possible to find analogies within regional coarse ware, and to assess the chronology; they are both late antique materials.
Represented by only one fragment of later chronology, it is highly probable that they are intrusive materials, not linked to the main pottery assemblage, but likely thrown in the water in a later moment.
Ollae 10 also gathers some sherds too tiny and/or badly preserved: V216/AP1273, V217/AP1660, V218/AP57, V219/AP1016, V220/AP1018, V221/AP316 and V222/AP1122. They do not provide any useful information but they have been mentioned only to complete the catalogue.
The small number of these un-identified fragments is a further proof of the consistency of the catalogue, where the whole variety of materials collected at *Stella 1* is incorporated, with only few exceptions.

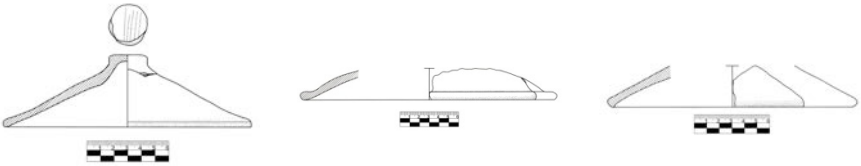
Catalogue number	V214
Inventory number	AP281
Graphic/Photographic Documentation	Pl. XXII, Fig. 80
Provenance	D4
Description	Fragment of an *olla* with globular body. The rim is long, everted, obliquely inclined toward the inside. The inner edge is concave, creating a lid-seat. The outer edge is obliquely cut and bears a groove in the middle. The neck is long and well defined, and it turns sharply, underlined by an incision, into a prominent shoulder.
Fabric	Almost depurated ceramic fabric, with small, ill-sorted and quite frequent inclusions, mainly consisting of glistering flakes of white mica. Small white grains, less frequent, are also visible. The ceramic surface appear quite rough when rubbed when the thumb and freshly broken fracture are sharp, without visible irregularities. The fragments colour is a quite homogeneous dark grey.
Dimension	Rim diameter: 20 cm Bottom diameter: --- Maximum height: 5,8 cm Maximum thickness: 0,7 cm
Production techniques	Faint horizontal striations, perpendicular to the vessel height and visible on both surface hints for a wheel-thrown vessel.
Usage marks	None
Comparisons	MODRIJAN, MILAVEC 2011, p. 194, Type 8, Tav. 97: 7; 106: 3-5 KONESTRA 2015b, pp.172-173, Tav. 12,4
Chronology	Second half of the 4th - 5th century AD

Catalogue number	V215
Inventory number	AP711
Graphic/Photographic Documentation	Pl. XXII, Fig. 81
Provenance	C5 Beta 3
Description	Fragment of everted rim. The inner surface is concave, creating a lid-seat, the superior edge is rounded. The neck is well defined and turns seamlessly into a prominent shoulder.
Fabric	Vessel surface appears rough when rubbed with the thumb since the ceramic fabric is characterised by very frequent medium and coarse, well-sorted inclusions, mainly consisting of white and black, sharp-edges rock grains. Freshly broken fractures are irregular and walls are thick. The vessel has been fired in an uneven reducing atmosphere, resulting in a dark colour, ranging from grey to black on the surface, while the core has a lighter, brownish, colour.
Dimension	Rim diameter: 16 cm Bottom diameter: --- Maximum height: 5 cm Maximum thickness: 0,8 cm
Production techniques	Faint wheel-marks visible on the inner surface suggest a wheel production.
Usage marks	None
Comparisons	CIPRIANO 2005, p. 148, fig. 12,4
Chronology	6th century AD

6.2 Lids

The group comprehends a small number of vessels, used to seal both open and closed vases.
According to rim morphology, three different types were identified within *Stella 1* materials (see *figure 32*). Lids were common in Roman times and the form is frequently found in current literature. Nonetheless, best analogies for the samples from the area of scattered artefacts come from the excavations in *via Crosada* at Trieste[1].
Stella 1 lids are going to be presented following the same order of the above-mentioned publication, i.e. a morphological one, starting from simpler rims to more elaborated profiles.
Furthermore, disregarding the normal *criterion*, lids were grouped together only on the base of morphological similarities; fabric are heterogeneous while numbers are small, therefore no attention has been paid to fabric differences in classifying and cataloguing.
Due to their extremely practical and functional destination, lids have a perfect design, not affected by fashion. The shape remained almost unchanged for a very long period. The order followed presenting the types in the catalogue do not have any chronological meaning, since so far it has not been possible to identify for these vases a chrono-typological evolution.
A brief chronological discussion is provided for each type, but no indication is offered for each single catalogue entry; indeed, as suggested above, each lid type turned out to be attested in a quite long time-span, making this vase useless to further determine the chronology of the site.

[1] See RICCOBONO 2007, pp. 114-115.



a. Lid 1 *b. Lid 2* *c. Lid 3*

Fig. 32. Stella 1, Lids.
Three morphological variants

Lids 1 - ***Trieste Antica 1*** groups four lids; only one of them is entirely preserved. Lids 1 are characterised by straight walls, ending in a simple rim with a round edge.

They share a similar fabric, characterised by frequent, medium and coarse, sharp-edge white (either calcite or rock fragments) and transparent (quartz) inclusions. On some fragments circular and quite irregular voids could have been produced either by the dissolution of organic temper or other kind of inclusions during the fire and/or for post-depositional causes.

Vessels surface appears quite rough when rubbed with the thumb. Despite the high frequency of inclusions, vessels were wheel thrown, and temper assumes a regular disposition. The regular thickness of the walls, on average 0,8 centimetres, derives from the wheel-turning. Freshly broken sections are smooth, without considerable irregularities. Lids were fired in reducing conditions to a dark colour, ranging from dark brown to grey to black. Spots characterised by slight differences in colour testify for uneven firing and/or cooling conditions.

The shape is associated with the type 17.1 identified by M. Vegas in her typology for Mediterranean coarse ware, attested from the second half of the 1st to the end of the 2nd century AD[2].

However, compared to similar lids found within the border of the *Regio X*, materials unearthed in Trieste point to a very broad chronology. Samples of this type were collected in layers dated from the 1st century BC to the 3rd - 4th century AD, with attestations even during the

[2] VEGAS 1973, p. 53, fig. 18, type 17, 1.

Middle Ages[3]. It is likely that the extreme simplicity of the type granted its survival for a very long time.
Stella 1 lids, despite their restricted number, turned out to be heterogeneous from a dimensional point of view; indeed diameters range from 14 to 30 centimetres, thus suggesting that their simple form was not related to a particular vessel shape.
The most frequent within *Stella 1* are **lids 2 - *Trieste Antica 2***, with five fragments.
Lids belonging to this type are characterised by straight walls, ending in a thickened rim with a round edge, well separated from the rest of the vase. The nearest analogies can be found again in lids from Trieste-*via Crosada*, where lids of this type were dated, on the basis of strict comparisons, between the end of the 1st century BC and the 2nd AD[4].
The position of *Stella 1 lids 2* in the area of scattered artefacts does not provide sound evidence that they really belonged to the main pottery assemblage. This uncertainty, added to the generally long life of such artefacts, prevented to insert these lids in the group of dating finds. Similar samples have been indeed unearthed in other *Regio X* sites also in later context, dated to the 3rd - 4th century AD[5].
The fabric is coarse, but there are some evident differences among the pieces that are going to be described in the following catalogue card.
Compared to previous type, lids 2 are more homogenous in size; diameters range from 20 to 25 centimetres. Probably they were used to seal *ollae*, however any possible further consideration must be postponed until the end of the exploration of the underwater archaeological deposit.
Only three fragments belong to **lids 3 - *Trieste Antica 3***. They are characterised by straight walls and a slightly thickened rim, turning inward. The inner edge is concave, facilitating the seating of the lid above the related pot.
Fabric is homogeneous for all the fragments and it is characterised by medium and fine, frequent and well-sorted inclusions. Both medium size, sharp-edge white grains and small size, almost circular, black rock

[3] RICCOBONO 2007, p. 114, type 1, Tav. 28, fig. 43.
[4] RICCOBONO 2007, p. 115, tipo 2, Tav. 28, fig. 44.
[5] CIVIDINI 2017, p. 255.

fragments can be recognised through macroscopic observation. Vessel surfaces are smoothed; all the vases were wheel-thrown and wheel-finished. Freshly broken fractures are sharp, with no visible irregularities. The average walls thickness measures 0,8 centimetres.
Lids 3 were mostly fired in reducing atmosphere, resulting in dark colour, ranging from dark grey to black. However, some differences among different spots of the same fragments and mainly between the colour of the surface and the colour of the core give a hint at uneven firing and/or cooling conditions.
Based on comparable sites, chronology offers broad range. Lids of this type are frequent in layers dated to the 1st century AD, however they have been unearthed also in context dated to a period between 4th and 7th century AD.
Few strictly analogies can be recognised for the only fragment belonging to this type preserved in a portion to be drawn and fully presented in the following catalogue card. However, they do not provide any information to further shrink the chronology. For this reason, also lids 3 were not considered in assessing *Stella 1* site chronology.
Since the discriminating *criterion* to approach lids was the rim morphology, it was deemed necessary to create a fourth group gathering two fragments that do not preserve any part of the rim, just the central knob.
Lids recognised within *Stella 1* coarse ware all present a central knob and almost straight walls. Their rim diameters range from 14 to 30 centimetres, suggesting that they were used to cover both open and closed vases. They belong to plain shapes, well attested in the Mediterranean basins and all over the Roman Empire.
Distribution and diffusion of a strictly practical design does not allow any conclusion on trade, commercial activities and cultural connections. Lids were reproduced with the same shapes in completely different fabric in several and sparse pottery workshops.
Among *Stella 1* coarse ware only 14 lids could be recognised; with rare exceptions, they are all very tiny fragments. The small number of them, compared to the far higher number of *ollae*, is however no surprise.

Ceramic lids are not very frequent, and their number is usually low when compared to other vases in Roman pottery assemblages. The small number of lids can be explained in various way. One lid can be used for different pots, even when the size do not fit exactly.
Stella 1 ollae were full at the moment of the wreck and they should have been sealed to prevent spilling and loss of content during the journey. However, ceramic lids can be easily replaced by covers in organic materials, such as modelled wood planks or pieces of textile fabric or leather, only rarely preserved in the archaeological record[6].
It is difficult to retrieve clear information from lids recovered within *Stella 1* materials, both for the purposes of understanding the cargo composition and of assessing the chronology of the site. It is not even safe to relate these vessels to the main archaeological deposit since they could have entered the archaeological record in a second moment, or they can be earlier, residual materials.
However, the precise correspondence of all the three types with contexts from Trieste gives further proof that the *Stella*/*Anaxum* basin, far to be a peripheral area, was perfectly inserted in the cultural framework of the *Regio X* and neighbouring territories of the Roman Empire.
For this reason, when it has been possible, a further field was added in the following catalogue cards, in which more strict comparisons with local materials have been listed. Not all the possible comparisons are going to be mentioned nor are they intended to have a chronological or any other meaning.
Their mention has been mainly conceived as a way to clearly highlight the relationship of the *Stella 1* site with other archaeological deposits located in the surroundings, further suggesting its belonging to a widely shared and spread culture.

[6] BATS 1988, p. 70.

Lids 1 - Trieste Antica 1

Catalogue number	V234 (almost entirely recomposed from 6 fragments)
Inventory number	AP480+AP596
Graphic/Photographic Documentation	Pl. XXIII, Fig. 82
Provenance	R0
Description	Almost entirely preserved lid with central elliptical knob and straight walls. Simple rim with rounded edge that continues seamlessly into the body.
Dimension	Rim diameter: 18 cm Elliptical knob: 2,8 cm x 3 cm Maximum height: 4,3 cm Maximum thickness: 0,8 cm
Production techniques	An evident wheel-ridging on the interior surface testifies that the lid was wheel-thrown. Furthermore, the exterior surface of the knob bear evident string-cut marks.
Usage marks	Diffuse burn marks, especially around the rim, on both surfaces.
Comparisons	BUORA et Alii 1995, p.151, Tav. XXI, 6

Catalogue number	V233
Inventory number	AP1381
Graphic/Photographic Documentation	Pl. XXIII, Fig. 83
Provenance	B8 Beta 3
Description	Fragment of lid with straight walls that continues seamlessly in a simple rim with rounded edge.
Dimension	Rim diameter: 30,8 cm Bottom diameter: --- Maximum height: 4 cm Maximum thickness: 0,8 cm
Production techniques	Wheel-thrown, as suggested by the regular disposition of inclusions.
Usage marks	None
Comparisons	CIVIDINI 2017, p. 254, type 1, fig. 37.2 RUPEL 1991, p. 157, Tav. 22, Ccg25 DUBOE 2011, p. 204, fig. 3

Besides these two fragments, also V231/AP161 and V232/AP629 belong to lids 1; their bad preservation state prevented the realization of either the drawings and single catalogue cards.

Catalogue number	V235
Inventory number	AP1330
Graphic/Photographic Documentation	Pl. XXIII, Fig. 84
Provenance	A8 Beta 2
Description	Fragment of a lid with slightly concave walls ending, with a well-defined turn, into a thickened rim with round edge.
Fabric	The vessel surface is rough when rubbed due to small and medium size, frequent and well-sorted inclusions (mainly white and black rock grains). Very fine flakes of glistering mica are visible through macroscopic observation. Freshly broken sections are regular and the walls have a regular thickness. The lid seems to have been fired in an oxidising atmosphere that determined a homogeneous orange colour.
Dimension	Rim diameter: 25,4 cm Bottom diameter: --- Maximum height: 3,2 cm Maximum thickness: 0,8 cm
Production techniques	Wheel-thrown
Usage marks	Faint burn marks around the rim edge that however could have been produced during the firing.
Comparisons	TONIOLO 1984, p. 209, fig. 5,8 RUPEL 1994, p. 234, Tav. 35, Ccg 102 MANDRUZZATO 2008, p. 100, Tav. XIV,13-15 DUBOÈ 2011, p. 304, fig.3 CEAZZI, DEL BRUSCO 2014, p. 945, fig. 6.19 CIVIDINI 2017, p. 255, tipo 2, fig. 38 BOTTOS 2018, p. 378, Tav. III, 5

Catalogue number	V239
Inventory number	AP1588
Graphic/Photographic Documentation	Pl. XXIII, Fig. 85
Provenance	A11
Description	Fragment of a lid with slightly concave walls that turns into the rim creating a shrinking. The rim is slightly thickened with a rounded profile: the outer edge bears a light incision.
Fabric	The fabric is characterised by a variety of fine and medium size, frequent and well-sorted inclusions. They are mainly black and white, sharp-edge rock fragments; fine *chamotte* grains and glistering flakes of mica could be easily recognised. The surface appears rough; freshly broken fractures are smooth, even if some irregularities, due to the presence of the inclusions, can be seen on the border. The walls are thick but regular. The vase is characterised by a lighter colour on both surfaces and a darker one in the core, testifying for uneven firing or cooling condition, with a sudden change of reducing and oxidising atmosphere.
Dimension	Rim diameter: 20 cm Bottom diameter: --- Maximum height: 4,9 cm Maximum thickness: 1,2 cm
Production techniques	Wheel marks visible on both surfaces testify for a production on the wheel.
Usage marks	None
Comparisons	RUPEL 1991, pp. 156-157, Tav. 22, Ccg 22 CASSANI 1995, p. 174, Tav. 2,4

V236/AP1436, V237/AP1496 and V238/AP1543 belong to this type, but they were too small to provide further information.

Lids 3 - Trieste Antica 3

Catalogue number	V240
Inventory number	AP1389
Graphic/Photographic Documentation	Pl. XXIV, Fig. 86
Provenance	D8/L
Description	Small fragment of a lid with straight walls. The rim is slightly thickened toward the inside, where it forms a kind of hook that could ease the covering. A small fragment of the wall is preserved.
Dimension	Rim diameter: 19 cm Bottom diameter: --- Maximum height: 3,3 cm Maximum thickness: 0,8 cm
Production techniques	Wheel thrown, as suggested by some faint horizontal striations visible especially on the inner surface.
Usage marks	None
Comparisons	CIVIDINI 1997, p. 73, Tav. 5o, Ccg60 RICCOBONO 2007, p. 115, tipo 3, Tav. 28, fig. 46-47 RUPEL 1994, p. 234, Tav. 35, CCg 106

Two other fragments, V241/AP675 and V242/AP535, share the same morphological and technological features, and they were thus inserted in this type.

Lids knobs

Two lids knobs have been identified among the *Stella 1* materials. Since only the knob and small part of the walls are preserved, it was not possible to surely assign them to any of the type described above.
According to the fabric, they could be compared to lids 3; they shared a coarse fabric, characterised by small and medium size, frequent and well-sorted inclusions, mainly consisting of sharp-edged white rock grains.
Only one lid knob has been drawn and will be fully described in the catalogue card; the other one, V243/AP135, is too badly-preserved.
Since only the upper part was preserved, the field dedicated to comparisons has been removed from the catalogue card.
The fragments testify only for the presence of two lids, but the shape does not provide information about the chronology and do not offer any specific characteristic to relate the *Stella 1* knobs with other materials.

Catalogue number	V244
Inventory number	AP1274
Graphic/Photographic Documentation	Pl. XXIV, Fig. 87
Provenance	D7 Alpha 5
Description	Elliptical lid knob that turns into almost straight walls creating a small shrinking.
Dimension	Elliptical lid knob: 3,4 x 3,2 cm Maximum height: 3,9 cm Maximum thickness: 0,6 cm
Production techniques	Wheel-thrown, as suggested by faint horizontal striations visible mainly on the inner surface.
Usage marks	None

6.3 Beakers

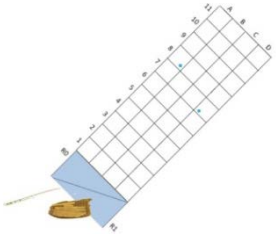
The word beaker identifies small drinking vessels, with a rim diameter lower than 10 centimetres, shaped to be held in one hand.
Among *Stella 1* materials, only six fragments have been identified as beakers. To these, there have to be added one rim fragment and one fragmentary base of two small *Auerberg* type vessels: according to their fabric and technological features they were included there[7].
Beakers collected within the area of scattered artefacts form a heterogeneous group. Each fragment can be considered an *unicum*, therefore no types have been identified among this shape. Privileging a unifying *criterion*, all the beakers were kept together, since they share the same sizes and functions.
The reduced number of beakers mirrors a situation already recorded in other archaeological deposits, where coarse ware beakers are rare. Beakers were frequent in perishable materials, such as wood, and they were quite common in glass and metal.
Moreover *pareti sottili* and *terra sigillata* cups, beakers, *kantharoi* and chalices were mainly used as individual drinking vessels. The low porosity of the clay, completely waterproofed by the vitrification process, along with aesthetic *criteria*, made them more suitable for the required purposes.
If the scarcity of beakers has a simple explanation, it is difficult to interpret their presence within *Stella 1* coarse ware.
They could have been personal items belonging to crew members, however there are no clear elements supporting this interpretation. Beakers are represented within the area of scattered artefacts by very heterogeneous and rare pieces that couldn't be easily interpreted.
The three fragmentary rims are very different from each other. Just the sizes are corresponding: two out of three pieces have a diameters of 9,8 centimetres, while measurements could not be executed on the third piece. Only one sherd can be dated however through only one analogy,

[7] They are the almost entirely reconstructed V223/AP 820+821+825 and the fragmentary base V225/AP 28+1698. See above, chapter 6.1.9 *Ollae 9/Auerberg ollae,* pp. 289-304 and the dedicated catalogue cards.

with a broad, generic chronology to the 1st - 2nd AD. The others were either too badly preserved or they have too common and generic features to be correctly identified.
The other three beakers are attested only by non-diagnostic bases.
Two rim fragments and one fragmentary base are going to be described in the following catalogue cards.
The low number of beakers is a characteristic quite common within coarse ware assemblages, since other production of beakers, best suitable for the function of drinking vessels, were preferred during Roman times. However, since it was not possible to assess the chronology of all the materials, caution incites to doubt the beakers as part of the main archaeological deposit.

Catalogue number	V227
Inventory number	AP1491
Graphic/Photographic Documentation	Pl. XXV, Fig. 88
Provenance	B9
Description	Small fragment of everted rim with a flatten edge, obliquely cut towards the outside. Walls are straight and simply decorated.
Decoration	Small circular clay cordon almost at the point of maximum expansion of the body.
Fabric	Coarse fabric, characterised by fine and medium size, irregular inclusions, mainly consisting of sharp-edged black rock grains. Surface appears rough when rubbed with the thumb and freshly broken sections are irregular. Walls have an almost regular thickness of 0,7 centimetres. The vase has a homogeneous beige-light brown colour, both on the surface and in the core.
Dimension	Rim diameter: 9,8 cm Bottom diameter: --- Maximum height: 4,4 cm Maximum thickness: 0,7 cm
Production techniques	The regular disposition of the inclusions on horizontal rows suggested that the beaker was wheel-thrown.
Usage marks	None
Comparisons	So far, no strict analogies have been found within published materials.
Chronology	Unknown

Catalogue number	V226
Inventory number	AP601
Graphic/Photographic Documentation	Pl. XXV, Fig. 89
Provenance	R0
Description	Very small and badly preserved fragment of a beaker, with globular body. The rim, slightly everted, is broken; the edge is completely missing. The passage rim-body is underlined by a small semicircular clay cordon.
Decoration	Two faint incised lines that border the clay cordon.
Fabric	The surface appears rough when rubbed with the thumb due to the presence of small and medium size, frequent and well sorted inclusions, mainly consisting of white and black rock grains. Freshly broken fractures are quiet irregular, while walls have a regular thickness. The fragment is of an homogenous dark grey colour, both on the surfaces and in the core.
Dimension	Rim diameter: not rec. Bottom diameter: --- Maximum Height: 5,6 cm Maximum thickness: 0,7 cm
Production techniques	Wheel-thrown, as suggested by faint horizontal striations visible especially on the outer surface and by the regular disposition of the inclusions.
Usage marks	None
Comparisons	Ceramiche in Lombardia,p. 208, Tav. CXXXVIII, n. 9 BOTTOS 2018, p. 379, Tav. IV, 2
Chronology	1st - 2nd century AD

Catalogue number	V230
Inventory number	AP1269+AP1374
Graphic/Photographic Documentation	Pl. XXV, Fig. 90
Provenance	AP1269: D7 Delta 5 AP1374: B8 Alpha 1 
Description	Two non-matching fragments belonging to the same beaker. Both the rim and the base are preserved. The rim is everted, slightly thickened, with a flatten edge, obliquely cut toward the outside. The neck turns sharply into a prominent shoulder, belonging to a globular body. The flat base is jointed to the vessel walls creating a slightly protruding foot.
Fabric	Vessel walls appear rough. The fabric is characterised by well-sorted, sparse, medium and coarse size inclusions, mainly consisting of white, sharp-edges rock grains. Coarser inclusions are visible mainly in the lower part of the vase. Freshly broken fractures are irregularly jagged; walls have an irregular thickness, ranging from 0,4 to 0,8 centimetres. The colour is not homogeneous, but varies within different spots, ranging from beige, to light brown, to light grey.
Dimension	Rim diameter: not rec. Bottom diameter: 3,8 cm Maximum height: 5,8 cm +1,8 cm Maximum thickness: 0,8 cm
Production techniques	Horizontal striations visible on the inner side suggest that the vessel has been wheel-thrown.
Usage marks	None
Comparisons	The generic features of the preserved portion of this beaker hinder the possibility to find strict analogies.
Chronology	Not determined.

6.4 Pans

The denomination of pans is used to identify open, shallow vessels, characterised by inclined or slightly curved walls and a rim diameter larger than the maximum height. They belong to open forms used mostly for cooking, according to blackened areas and burnt marks scattered all over the external surface of the majority of samples.
Within *Stella 1* coarse ware, four sherds have been identified as pans; despite they represent a quite homogeneous group, it is possible to divide them in two subgroups, each one referring to a peculiar production.
Three of these pans are characterised by a coarse red-brown fabric, mainly tempered with black sand, small flakes of glistering mica and tiny fragments of augite; their peculiar feature is the presence, on the inner surface, of an opaque red *engobe* (see *figure 33*).
They indeed belong to a well-known Roman cooking pottery class, namely *Pompeian Red Ware.* A now long tradition of studies widely demonstrated that this kind of vessels were distributed all around the Mediterranean and across the provinces of the Roman Empire; they are well attested in all the central Europe territories, and several samples have been found also in *Britannia* and in the Eastern provinces of *Grecia* and *Asia Minor*[1].

Fig. 33. Stella 1.
An example of Pompeian Red Ware

[1] GOUDINEAU 1970, p. 162.

Around the Mediterranean and across the provinces of the Roman Empire they have been addressed with several names, ranging from the Italian *ceramica a vernice rossa interna*[2], to the French *ceramique à engobe interne rouge-pompéien*[3], to the Spanish *barniz interior rojo pompeiano*[4].
This kind of ware has been firstly identified at the beginning of the 21st century by Loeschke, who defined *Pompejanisch-Roten Platten* some pans and plates characterised by an internal red-clay covering, collected in the legionary camp of Haltern, in nowadays Germany[5]. In Schindler-Kaudelka's work on Magdalensberg finds, they are called *Backplatten* to underline the proper use[6].
This class gathers mainly open forms, plates and especially pans, both quite large, and their relative lids. A certain number of plates shows either a stamp or a *grafitto ante cocturam*, in most cases placed on the outer side of the bottom, near the body[7].
Loeschke, noticing that these vases were mainly present in military settlements, proposed that they were part of the soldiers' equipment and that they were used to cook the *puls*, a traditional food in Ancient Roman times, consisting in a kind of pottage made simply mixing grains, salt and water. In his explanation, the red-clay covering made the pan non-stick, facilitating the cooking procedures[8].

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[2] It turns out to be difficult to trace back the first appearance of this denomination in Italian archaeological literature; being produced firstly in Italy, these vases represent a common finds in almost all the Roman archaeological sites. The denomination appears to be well known and widely accepted by scholars already in the publication of the Luni - *Luna* excavations that represents the first Italian work that focus also on coarse ware fabric. (See chapter 4.1, p. 72 and *Luni I,* cc. 279-281). It is likely that the name came from the description given to these vases by N. Lamboglia, in his first publication of coarse ware from Ventimiglia - *Alibintimilium* (See LAMBOGLIA 1950, p. 33*: "vasi verniciati(...) internamente muniti di una bella vernice rosso cupa*").

[3] This denomination was firstly adopted in the nineteen seventies in the work by C. Goudineau, who firstly created a typology for these vases, in use still today. See GOUDINEAU 1970.

[4] It is the denomination used by M. Vegas already in her preliminary work about the Mediterranean coarse ware, see VEGAS 1964, pp. 22-27 and then further confirmed in her milestone *Cerámica comúm romana del Mediterráneo Occidental* (see VEGAS 1973, pp. 47-49).

[5] For the first definition of the type, see LOESCHCKE 1909.

[6] See SCHINDLER KAUDELKA 1986.

[7] See CAVASSA 2016.

[8] LOESCHCKE 1909, p. 268.

Another possible interpretation, always saving the non-sticky function of the red *engobe*, is that these pans were used to bake bread; the hypothesis is sustained on the basis of some findings from Pompeii, where samples of *Pompeian Red* vases have been recovered still filled with breads, possibly because they were waiting to be put in the oven at the moment of the Vesuvius eruption[9].

It could not be excluded that these vases were used to prepare also other Roman staple foods, such as the *polenta* or *placenta,* a salty or sweet flat bread that was also used during religious ceremonies[10].

Ancient literary sources suggest that they were also used to prepare *patina*, a traditional baked dish, containing a high amount of eggs[11].

The denomination adopted to firstly define the production, *Pompejanisch-Roten Platten*, derives from the red colour of the *engobe*, that resembles the colour of Pompeii frescoes, but also suggests that already in this first publication, these vases were recognised as a typical production of Southern Italy, especially of the Vesuvian area. Indeed also at a macroscopic observation, the fabric, characterised by glistering flakes of black mica and fine obsidian inclusions, can be recognised as volcanic clay, compatible with deposits of Tyrrhenian Central Italy.

This peculiar fabric improves the quality of the vases, decreasing their porosity, since volcanic materials are waterproof, and enhancing their resistance to thermal shocks, since these volcanic inclusions do not experience size variations when exposed to high temperature[12] .

Pompeian red ware were a high quality production, especially made for an use over the fire, as cooking vases. They started to be produced, apparently in the last quarter of the 3rd century BC, in a restricted area, including only nowadays Southern Tuscany, Latium and Campania, but, starting from the 1st century BC, they were widely exported not only in Italy but also in other Roman provinces[13].

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[9] See CELUZZA 1985, p. 109 and mentioned bibliography.

[10] See GOUDINEAU 1970, p. 165, note 4.

[11] GRÜNEWALD, PERNICKA, WYNIA 1980, p. 259.

[12] See OLCESE 1993, p. 128: "*L'utilizzo di materiale vulcanico, contenente abbondanti particole di tufo, che non assorbono acqua e non si restringono durante la fase di cottura, è, secondo alcuni studiosi, una garanzia di qualità e resistenza, per la ceramica che deve essere esposta al fuoco".*

[13] CORTI 1997, p. 105.

This is the reason why vases of this kind are quite common in several sites and the growing number of publications led, during the nineteen seventies, to create a dedicated typology, developed by C. Godineau, and still in use[14].

Few years after this classification, these vases have been identified with a peculiar production mentioned by ancient literary sources, the *cumanae testae*[15]. Recent excavations carried out by Università di Napoli - L'Orientale in the Roman artisanal neighbourhood in Cuma brought to light a pottery dump almost completely filled with *Pompeian red wares*, attesting without any doubt a local production.

However, as noticed before, the origin of the product should be related more broadly to the Vesuvian area (a further production of these vases has been identified also in Pompeii, to quote only one other example).

During the second half of the 1st century AD several provincial workshops started to produce autonomously this kind of vessels, faithfully reproducing the morphological and dimensional characteristics of the original products[16]. Archaeometric analysis enabled to locate some of these earlier provincial workshops in Northern Italy.

Some productive centres have been identified in the Po Valley, North of the river, and in the area surrounding Bologna - *Bononia*[17].

Petrographic and chemical characterisation of some materials unearthed in Milan testified for their production using clay collected in an area between the rivers Seveso and Olona, in nowadays Varese

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[14] See above, note 2, p. 325.

[15] This identification has been proposed in 1975 by G. Pucci, on the basis of the Martial epigram XIV, 114: "*cumano rubicundam pulvere testam"* and of same passages in Apicius's cookbook, where *cumana* (scil. *patina* o *patella*) is mentioned six times (*De re coq.* IV,11,138;V,2,196; V,4,198; VI,2,238; VI,5,241 et VII,7,302), referring to a coking vessels that could be placed directly over the fire.

[16] For the purposes of the present research, only local productions attested in Northern Italy are going to be discussed in detail in the next lines; however, it has to be reminded that several local productions are attested also in Roman provinces outside Italy. Workshops that produced *Pompeian Red Wares* have been identified by recent studies in nowadays Spain, Portugal, Great Britain, in several sites of the Roman provinces of *Asia Minor* and *Greece*, and along the Northern *limes* of the river Rhenus. See VEGAS 1973, p. 48 and the recent updates in LEOTTA 2005, p. 116 (with mentioned bibliography).

[17] See GIORDANI 1988, p. 41 and mentioned bibliography.

district[18], and some other samples found during the excavations of the Underground were identified as local productions[19]. Furthermore, archaeometric analysis performed on some samples collected in Calvatone - *Bedriacum*, along the *via Postumia*, led to recognise the existence of a local production within the *Regio X*, in a volcanic area located at the foot of Colli Euganei, in nowadays *Veneto* region[20].
Other evidences, so far still not supported by archaeometric analysis but only by archaeological data, seem to suggest that a possible production was located in the Aquileia's *ager*. This hypothesis has been firstly proposed by M. Buora, taking into consideration the presence of two stamps on two *Pompeian Red Ware* bases collected in Aquileia and at Castions di Strada, Loc. Rem del Sterp.
The fragment from Aquileia bears the partial stamp *FORES[...]*within a rectangular cartouche[21], while the fragment from Castions di Strada has a rectangular cartouche with a completely readable name, *C. AURELI*[22]. Since so far both stamps turned out to be *unica* and no comparisons could be found within *Pompeian Red Ware* published marks, Buora proposed to identify a local production in the Aquileia's *ager*, to be dated to the Augustan age, when stamps on different products, especially bricks and *terra sigillata*, were a fashionable *phenomenon*. He thus suggests that, from this quite early periods, settlements within Aquileia's territory did not completely rely for these products on external markets, but were able to produce these vessels and even to proudly sign them[23].

[18] See BONINI 2010, p. 307.
[19] Among the materials brought to light during the construction of the Underground, several *Pompeian red ware* have been recognised; within them, five different fabrics have been identified. Besides clear imports from South/Central Italy, several materials share the same fabric features of other coarse ware vessels, enabling to identify also a local production of some red-clay covering materials. See *Scavi MM3,* pp. 129-132 and especially pp. 131-132 for fabric descriptions.
[20] VOLONTÉ 1996, p. 129.
[21] BUORA *et Alii* 1994, p. 65, Tav. V, VR 1.
[22] CASSANI, TERMINI 1991, p. 16, inv 264889
[23] BUORA *et Alii* 1994, p. 65: "*Stando alla documentazione finora disponibile, se ne dovrebbe ricavare che per questa classe di tegami da fuoco l'agro aquileiese non dipendeva da importazioni esterne e che nell'età augustea i produttori locali, che apparentemente rifornivano un mercato molto ridotto, amavano firmare i loro prodotti*".

On the other side, as already noticed by C. Goudineau, the extreme morphological and technological simplicity of these vases fostered the activation of local productions in several territories, even outside Italy.
Despite the *Stella*/*Anaxum* basin was well connected with the region of the Colli Euganei and was within the *ager* of Aquileia, both places where a local production can be identified, however *Stella 1 Pompeian Red Ware* fabric features led to identify them as imports from Central-South Italy, likely from the surroundings of the Vesuvius.
A detailed description of pottery fabric is going to be provided for each piece in the following catalogue cards, because of some minor differences easily spotted even through macroscopic observation; they should thus be considered products of different workshops, but they are not compatible with Northern Italy productions.
Both *Stella 1* rim fragments belong to pans already described in Goudineau classification; they are both quite early products, dated to the Late Republican - early Imperial age. This early dating further support their nature as imported commodity.
The third sherd, V247/AP951, is a fragment of a flat base; it could be generally ascribed to a pan, but its characteristics do not provide any further element to allow the identification of the type it belongs to. It is so poorly preserved that it will not be described through a dedicated catalogue card.
The fourth sample identified as a pan within *Stella 1* coarse ware, V248/AP1331 cannot be considered a *Pompeian Red Ware* since no traces of the red internal *engobe* are preserved. Furthermore, internal surface is polished and well refined, lowering the possibilities that it was originally covered with the typical red *engobe*.
However its fabric, characterised by black sand, tiny flakes of glistering mica, as well as small fragments of shining obsidian, visible also through macroscopic observation, immediately identified it as an import from the Vesuvian area as well.
The peculiar bifid rim enabled to identify this pan with pan type 11 of the M. Vegas's preliminary classification of Mediterranean coarse ware. Pans of this type are dated to the 1st century AD[24].

[24] VEGAS 1964, pp.21-22, fig. 6.1.

For both *Pompeian Red Ware* samples and the imported pan collected at the *Stella 1* site no list of possible analogies has been made. Because of the frequency of these shapes all over the Roman Empire, plotting a distribution map would have been meaningless. Inevitably far from exhaustive, it would not help in reconstructing the complex system of trade of these ceramics, that circulated exploiting both terrestrial and maritime routes all over the Roman Empire.
For this reason, in the following catalogue cards the voice *comparisons* registers only the types identified within Goudineau's and Vegas's classification, and their relative chronology[25].
All the *Stella 1 Pompeian Red Ware* rim fragments have been identified as belonging to pans that were firstly produced between the end of the 1st century BC and the 1st century AD. Export from Italy ceases at the end of the 1st century AD when in all the Roman provinces regional potters finally became autonomous.
Even if the period of highest diffusion of these vases could be dated between the Augustan age and the middle of the 1st century AD[26], they continued to be produced and traded until the 3rd century AD, when they started to be replaced by African products (both African red slip and African cooking ware)[27]; it is thus quite difficult to precisely assess their chronology.
The *orlo bifido* pan, not internally slipped, belong to a production usually older than the slipped ones but that can be dated to the 1st century AD.
The chronology suggest that all the pans were part of the original deposit; they cannot be considered later, intrusive materials. The low

[25] An updated list of *Pompeian Red Ware* collected in several sites within the territories of Aquileia and Trieste is provided in DE FRANZONI 2018, pp. 329-330.
Also bifid-rim, Tyrrhenian pans are widely attested within *Regio X*: within Aquileia's *ager*; same samples have been collected in different *villa rustica* such as in Joannis (STRAZZULLA RUSCONI 1979, cc. 62-63, Tav. 6, fig. 3) and at Flambruzzo, Loc. Il Bosco (MAGGI 2001, p. 90, Tav. 14, Ccg 7). Two samples were identified on the ploughsoil during surveys at Castions di Strada, Loc. Rem del Sterp, where also *Pompeian red Ware* was found (CASSANI, TERMINI 1991, p. 18, inv. 264830 and 264843) and in the Roman settlements of Moggio Udinese (FALESCHINI 2018, p. 240, tav. 5, 86), to quote only few samples, all sharing the same chronology at the 1st century AD.
[26] AURIEMMA *et Alii* 2008, p. 169.
[27] PUCCI 1975, p. 371.

number forces to consider them not as part of the cargo, but as elements of the board equipment.
The reduced number of sherds belonging to this class should not be surprising; it is indeed a common feature registered on several different sites, especially when located quite far away from the first productive centres. Already Goudineau noticed that *Pompeian Red Ware*, and generally speaking cooking vessels from the Vesuvian area, were attested only by very few samples, especially when compared to the higher number of coarse and common ware. He explained this *phenomenon* with the typical conservatism of these products, suggesting that, especially imported materials, were passed down through generations, also because they were apparently used to cook traditional food, whose quality could have been perceived in a way linked with the pans themselves[28].
Being an extremely frequent, widespread commodity, available even in the remotest place of the Empire, no peculiar economic meaning can be assigned to these samples. Nevertheless, being imported vessels from the Vesuvian area, *Stella 1* pans testify that the *Stella/Anaxum* basin was autonomously inserted in long-distance trades.

[28] GOUDINEAU 1970, p. 179 .

Catalogue number	V246
Inventory number	AP440
Graphic/Photographic Documentation	Pl. XXVI, Fig. 91
Provenance	R0
Description	Fragment of a pan (the entire profile is preserved). Slightly concave walls that turns seamlessly into a simple rim with round edge. The base is flat.
Fabric	The brown fabric is characterised mainly by frequent, small micaceous inclusions. Fine fragments of black sand and seemingly augite are very frequent. The fracture is smooth and the vessel surface is regular when rubbed with the thumb. Internal slip is not well preserved; only small spots are recognizable. It appears thin, red-brown in colour.
Dimension	Rim diameter: 32,6 cm Bottom diameter: 23 cm Maximum height: 5,5 cm Maximum thickness: 0,8 cm
Production techniques	Faint wheel-marks visible on the inner surface testified for a wheel production.
Usage marks	The outer surface, as well as the rim edge, is heavily sooted. Burnt traces cover homogeneously the entire surface, suggesting that the pan was used on the fire.
Comparisons	GOUDINEAU 1970, p. 166, type 16, Tav. I, 16
Chronology	From the end of the 1st century BC

Catalogue number	V245
Inventory number	AP1495
Graphic/Photographic Documentation	Pl. XXVI, Fig. 92
Provenance	B9 Alpha 2
Description	Fragment of a pan (the entire profile is preserved), characterised by straight, slightly oblique walls that turn seamlessly into a simple rim with rounded edge. The base is flat, with a narrow groove on the underside, at the joining point with the rest of the vase.
Fabric	Vessel surface appears rough when rubbed with the thumb, but freshly broken fractures are regular. Fabric is characterised by fine and medium size, well sorted and frequent inclusions. Macroscopic observation enables to identify black sand, white particles and tiny flakes of glistering mica. Some very tiny, mostly elongated voids, are visible. The fragment has a homogeneous colour; it is cream with a pale grey core. The thin, red-brown internal slip is not well preserved and it is visible only on a small portion of the internal surface.
Dimension	Rim diameter: 19,6 cm Bottom diameter: 17 cm Maximum height: 5,1 cm Maximum thickness: 0,9 cm
Production techniques	Wheel-thrown
Usage marks	None
Comparisons	GOUDINEAU 1970, p. 168, type 29, Tav. II, 29
Chronology	From the Claudian age

Catalogue number	V248
Inventory number	AP1331
Graphic/Photographic Documentation	Pl. XXVI, Fig. 93
Provenance	A8 Delta 2
Description	Fragment of very thin concave walls that turn seamlessly into a simple, bifid rim.
Decoration	Pale brown/orange fabric, with rough surface. Through macroscopic observation it is possible to identify small and medium size, frequent inclusions, consisting of black sand grains, tiny flakes of glistering mica, as well as small fragments of shining obsidian. A very coarse, sharp-edge grey rock fragment characterised the outer surface. Freshly broken fracture are smooth and walls have a regular, reduced thickness.
Dimension	Rim diameter: 24,4 cm Bottom diameter: Maximum height: 5,5 cm Maximum thickness: 0,6 cm
Production techniques	Wheel-thrown because of the very thin walls and by the regular distribution of inclusions in horizontal lines.
Usage marks	None
Comparisons	VEGAS 1964, pp. 21-22, fig. 6.1
Chronology	From the 1st century AD

6.5 Bowls

Bowls is the term here used to identify open vessels, whose rim diameter is larger than the maximum height. They differ from pans since they are much deeper and they are characterised by sharply curved walls, ending in a plain rim. Their functional destination is completely different.

Within *Stella 1* materials two fragments belonging to different vases fall into this description: V250/AP658 and V251/AP577. They are very similar from both a morphological and a technological point of view.

Both fragments show curved walls, ending in a rim with a round edge, curving inwards.

They have been both fired in a reducing atmosphere, resulting in a homogeneous black colour, ranging from dark grey to black. Vessel surface is smoothed when rubbed with the thumb. Medium and coarse, sharp-edge inclusions are frequent: they are mainly white rock grains (either calcite or quartz). Tiny *chamotte* fragments are rarer. Freshly broken fractures are jagged; the average thickness is 0,9 centimetres.

These bowls represent a very simple form, widely attested not only within *Regio X* but more broadly in all the territories of the Roman Empire[29].

However, in this case similarities could be explained simply recalling the extreme simplicity and the high functionality of the form; comparisons should be not regarded as proof neither of the trade of this shape, nor of cultural contacts within neighbouring territories, that would have led to reproduce the same kind of vases also in areas different from the ones where the form firstly appeared.

For this reason, any list of comparable materials would not be exhaustive; only the strictest comparisons (i.e. both morphological and technological) with materials unearthed in the

[29] CIVIDINI 2017, p. 251.

Aquileia's *ager*, are going to be mentioned in the following catalogue card[30].

For this same reason, no distribution map has been created; in this particular case, the reproduction of the same shape is not due to the diffusion of the form, but to the fact that its extreme simplicity made highly probable an autonomous realization by independent pottery workshops.

Both within *Regio X* and beyond similar bowls are commonly dated from the 1st to the 4th century AD[31].

Stella 1 bowls could be either part of the main archaeological deposit or intrusive, later materials; the question remains still open.

It is unlikely that they belong to the cargo, mainly because of their low number, not compatible to a stock of traded commodity, but also because their wide opening would have made them unsuitable to store food during a transport without a high risk to spill all over the content.

Bowls are commonly considered individual serving vessels; they could have been part of the board equipment, or even a personal belonging of a crew member.

However, also the hypothesis that the two sherds joined the area of scattered artefacts in a later moment should be taken into consideration, also looking at their poorly state of preservation and considering that no matching fragments have been so far collected within the area of scattered artefacts.

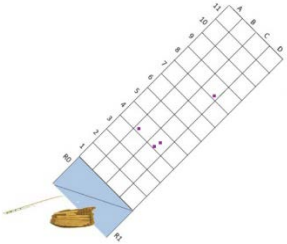
[30] Since V250/AP658 is very small and poorly preserved, only V25/AP577 is going to be completely described. A first list of comparable materials, collected in a number of Northern Italian sites, is provided in RUPEL 1988, c. 111.

[31] This broad chronology is also shared by bowls collected in Aquileia, that have been recognised as a widespread production attested from the 1st century AD but that were found also in later contexts.

Catalogue number	V251
Inventory number	AP577
Graphic/Photographic Documentation	Pl. XXVII, Fig. 94
Provenance	R0
Description	Fragment of a bowl with sharply curved walls. Rim is thickened, curved inwards; it has a quiet flatten outer edge and a rounded inner one.
Dimension	Rim diameter: 33,6 cm Bottom diameter: --- Maximum height: 3,3 cm Maximum thickness: 0,9 cm
Production techniques	The vase seems to be wheel-thrown but no visible wheel marks could be seen on its surface.
Usage marks	None
Comparisons	RUPEL 1988, c. 111, Type 6a, Fig. 26 RUPEL 1991, p. 155, Tav. 22, Ccg 21 RUPEL 1994, pp. 222-223, Tav 32-33, Ccg 68-69 BUORA et *Alii* 1995, p. 153, Tav. XXII, Fig.4 BUORA 2005, p. 98, Tav. 25, Ccg 10 CIVIDINI 2017, pp. 250-251, type 2B, fig. 29,2
Chronology	From the 1st to the 4th century AD

6.6 Platter

The name defines an open vessel, whose height is lower than the rim diameter. Platters differ from bowls not only from a morphological point of view but also because they are not individual vessels; they are generally considered serving devices.
Among *Stella 1* materials one platter has been identified. It has been reconstructed from 25 small fragments, recovered in different spots within the area of scattered artefacts.
It is characterised by a coarse fabric, fired in reducing atmosphere. Despite the simple shape, some strict analogies occur in a restricted area, within the Aquileia's *ager.*
A very similar platter has been unearthed in the Northern necropolis of Ljubljana-*Emona*, that was directly linked with Aquileia by a main consular road that facilitate the circulation of goods and models.
Chronology points to the 1st century AD, from the Augustan age onwards. Therefore, it is likely it belongs to the main pottery assemblage.
Like the bowls, because of its uniqueness and its peculiar shape, it was not part of the cargo, but rather of the board equipment.

Catalogue number	V249 (almost entirely reconstructed from 25 fragments)
Inventory number	AP269+AP273+AP410+AP1311
Graphic/Photographic Documentation	Pl. XXVII, Fig. 95
Provenance	AP269: B4 AP273 : C4 AP410: C4 AP1311: C8 
Description	Almost entirely reconstructed platter with flat base and straight walls. The rim, slightly thickened, is slightly inclined toward the inside; it ends with a round edge characterised by a deep groove, used as a lid seat.
Fabric	The fabric is characterised by frequent, medium and coarse inclusions, mainly sharp-edge white grains (calcite and quartz) completed by more rare tiny flakes of glistering mica. Wall thickness is regular, and the vessel surface appears smoothed when rubbed with the thumb. The internal surface has been finished, appearing smoothed and regular. Freshly broken fractures are irregular and jagged. The vessel has been fired in non-homogeneous reducing conditions, resulting in a black colour of the surface, while the core is dark grey.
Dimension	Rim diameter: 24,8 cm Bottom diameter: 17,2 cm Maximum height: 4 cm Maximum thickness: 1,1 cm
Production techniques	Wheel-thrown, as suggested by the wheel-marks visible on the inner surface.
Usage marks	None.
Comparisons	PLEŠNICAR-GEC 1972, t. 635, Tav. CXLVI, 3 CASSANI 1991, p. 98, fig. 19 BUORA, CASSANI 1999, p. 113, Tav, XXXII, 1
Chronology	From the Augustan age to the end of the 1st century AD

6.7 *Varia*

This is a very heterogeneous group that gathers only nine vases that cannot be inserted in any other of the previously presented forms.
These fragments do not add any essential information for a better comprehension of the site. In most cases they turned out to be *unica* and/or intrusive materials, thus not really belonging to the main archaeological deposit.
Their low number confirms once again the homogeneity of the area of scattered artefacts, since the bulk of materials here collected could have been identified within a restricted number of chronologically homogeneous vessels forms; furthermore, it further sustains the consistency of the classification proposed in the present catalogue, able to encompass the majority of materials.
Within *Varia*, four sherds V253/AP1243, V254/AP422, V255/1684 and V256/AP1651+AP1664, three rim fragments and one fragmentary base, share similar fabric and morphological characteristics.
They are characterised by a soapy surface; freshly broken fractures are irregular but not sharp. The fabric presents coarse and frequent, ill-sorted inclusions (mainly black and grey rock fragments); several big voids can be observed both on the surface and in the vessel core. The average wall thickness is 1 centimetre. Vessels presents an uneven colour, with clear differences between the surface and the core. The outside is usually beige/light brown, while the core is darker, due to non-homogeneous firing condition. Changes in colour can be spotted even on the surface.
They are too fragmentary and too badly preserved to be surely identified and to find strict analogies. Nevertheless, the extreme simplicity of their profile, combined with the low technology attested by their fabric features, suggest that they are pre-Roman materials, belonging to local, Iron age productions.
They should be considered as intrusive materials, lying on the river bed before the formation of the main archaeological deposit.
No clear information can be retrieved from their positions; they have been collected in different spots within the area of scattered artefacts,

suggesting that they were thrown independently in the river, in different moments. However, since the water flow causes a continuous mingling of the archaeological materials, it is highly likely that the position where they were collected was not the original one.
Their early chronology further confirms a pre-Roman frequentation of the *Stella/Anaxum* rivers and its shores, already testified by several pre-Romans evidences unearthed along the watercourse[32].
None of the pieces was drawn, since they are so poorly preserved that in any case it has been possible to reconstruct the diameter; however, they are going to be presented in details in the following catalogue cards.

[32] See chapter 2.2, p. 20.

Catalogue number	V253
Inventory number	AP1243
Graphic/Photographic Documentation	None
Provenance	B7
Description	Fragment of a bowls with wide mouth, with slightly thinned rim with round edge.
Dimension	Rim diameter: not rec. Bottom diameter: --- Maximum height: 3,7 cm Maximum thickness: 1,1 cm
Production techniques	Hand-made, since no clear hints of wheel production can be spotted and since the coarse dimension of inclusions would have prevented the manufacturing on the wheel.
Usage marks	None

Catalogue number	V254
Inventory number	AP422
Graphic/Photographic Documentation	None
Provenance	R0
Description	Fragment of a probably a closed vase (*olla?*). The rim is thickened, flatten on the inner surface and rounded on the outer, assuming a triangular shape. Walls appear almost vertical and they have regular thickness.
Dimension	Rim diameter: not rec. Bottom diameter: --- Maximum height: 8 cm Maximum thickness: 0,9 cm
Production techniques	Hand-made.
Usage marks	Scattered burn marks on the inner surface.

Catalogue number	V255
Inventory number	AP1684
Graphic/Photographic Documentation	None
Provenance	C11
Description	Fragment of a simple slightly thickened rim with round edge. It is preserved in a very small portion, making impossible to define the form it belongs to.
Dimension	Rim diameter: not rec. Bottom diameter: --- Maximum height: 4,3 cm Maximum thickness: 1,3 cm
Production techniques	Hand-made.
Usage marks	None

Catalogue number	V256
Inventory number	AP1651+AP1664
Graphic/Photographic Documentation	None
Provenance	D11
Description	Two matching fragments of a flat base with vertical walls. The walls make a concave entry with the body, meeting the base almost vertically at the attachment point. This results, on the outer surface, in a little shrinking just before the base.
Dimension	Rim diameter: --- Bottom diameter: not rec. Maximum height: 3,8 cm Maximum thickness: 1,8 cm
Production techniques	Non definable.
Usage marks	None

Two fragments, V257/AP1478 and V258/AP1308, share a similar oxidising fabric, with sparse, well sorted inclusions, of uneven dimensions. Poor preservation and the extreme plain shape prevented any typological or dimensional definition and classification.
V257/AP1478 is so badly preserved that it hasn't been possible even to reconstruct the diameter. It is characterised by a thickened rim, with a superior, flat edge; walls are almost vertical. These morphological characteristics suggest that it could belong to a *casserole*.
The small dimensions and the extremely simple profile prevent even to hypothesize to what kind of vase V258/AP1308 belongs to, neither to clear orient the piece or to reconstruct the diameter.
Both pieces are going to be further described to reach the highest level possible of completeness and accuracy in presenting and describing *Stella 1* materials. Nevertheless, at the current state of the research, no further information can be retrieved from them.

Catalogue number	V257
Inventory number	AP1478
Graphic/Photographic Documentation	Pl. XXVIII, Fig. 96
Provenance	A9
Description	Rim fragment, possibly belonging to a *casserole*. Walls are almost vertical; the rim is thickened, everted, with a flatten edge. The passage between the rim and the wall is underlined by a groove.
Fabric	The vessel surface appears rough when rubbed with the thumb and freshly broken fractures are sharp. Both in the core and on the surface frequent, fine and medium size, well sorted inclusions can be seen: white and black rock fragments, as well as tiny flakes of mica can be recognised. In the core, some voids, heterogeneous in form and dimension, can be the results of the fading of organic temper during the firing. The fragment presents a black core, while outer surfaces are orange/beige; this is the result of uneven firing/cooling atmosphere.
Dimension	Rim diameter: not rec. Bottom diameter: --- Maximum height: 3,2 cm Maximum thickness: 1,9 cm
Production techniques	The regularity of the surface and of the walls thickness suggests a wheel-production.
Usage marks	None

Catalogue number	V258
Inventory number	AP1308
Graphic/Photographic Documentation	None
Provenance	C8
Description	The fragment seems to be a flatten flange, slightly obliquely cut outwards, belonging to a vessel with a wide opening. Unfortunately the piece is too small to clearly define the kind of vessel it belongs to.
Fabric	Pottery surface appear rough when rubbed with the thumb; the fabric is characterised by frequent, ill sorted medium size inclusions. They are mainly angular shape rock fragments, black and white. Some glistering flakes of mica are visible, as well as black sand and circular shape microfossils. Few, irregular and bug voids are also present on the surface. Freshly broken fractures appear regular, as well as walls thickness. The fragment has a homogeneous orange/red colour.
Dimension	Rim diameter: not rec. Bottom diameter: --- Maximum height: 1,1 cm Maximum thickness: 1,1 cm
Production techniques	The regularity of the fragment suggest that the vase was wheel thrown.
Usage marks	None

The last three pieces, all well preserved, are very different from each other and should be considered as *unica* within the pottery assemblage.
V252/AP442+AP454+AP494+AP542+AP573 was reconstructed from 25 fragments. It has morphological and fabric characteristics very similar to *ollae 1b*[33], but very different proportions; the height is smaller than the diameter, and the vase appears squat and flatten.
Carrying capacity was calculated after the reconstruction of the entire profile, resulting in 3,88 Litres = 7,10 *sextarii* (i.e. 14,20 *heminae*), a value slightly higher than the average for medium size *ollae*[34].
V252/AP442+AP454+AP494+AP542+AP573 could have been inserted within *ollae 1*, however it would have represented an *unicum* for its dimensions, that could hint to a different function of this vase. Indeed its shape is more similar to bowls than to *ollae* and the wide opening, combined with the short body, would have made the content more accessible.
Vases of this type have been frequently found in association with the more common slimmer *ollae 1* both in settlements and in necropolis[35].
Chronology points to the 1st - 2nd century AD and, as for the canonical *ollae 1*, a derivation from pre-Romans prototypes seems probable[36].
Geographical distribution is overlapping as well; the low and flat variant is attested in a wide area that comprehends more or less the entire Northern Italy. Production in several local workshops started already at the beginning of the 1st century AD[37].
Regarding their function, flat *olla 1* seems more common within necropolis, but this *datum* could be a bias due to the fact that in Northern Italy necropolis are better investigated than settlements, and due to the fact that in these contexts vases are well preserved, and thus it is easier to detect this variant, not immediately perceived if the vase is preserved only in fragments. Furthermore, no hints of a production specifically made for the funerary destination have been so far individuated; it is highly likely that the presence in the necropolis

[33] See chapter 6.1.1 *Ollae 1*, p. 145.
[34] See chapter 6.1.1 *Ollae 1*, pp. 153-154.
[35] The list of the strictest comparisons is going to be provided in the following catalogue card.
[36] CASARI 2002, p. 108.
[37] ISTENIČ 2000, p. 114.

resulted from recycling a daily-use vase for the new functional destination.
A hint of the function of these vases could come from a sample collected in the Roman *villa* of Desenzano del Garda, where a flat *olla 1* was unearthed, bearing the *graffito PANIS* on the shoulder. The *graffito* has been interpreted as a reference to the content, yeast base or sourdough used to prepare bread[38]. So far this is the only example, and further investigation are needed to determine whether this is only an occasional use or it mirrors a more habitual custom.
Inside the *Stella 1* flat *olla* traces of a black substance, seemingly organic, are preserved, indicating that the vase was full, or at least it has been used, when it joined the archaeological deposit.
Chronology suggest that the pot belongs to the main pottery assemblage, either part of the board equipment or of the cargo, where the different shape was an easily spotted hint for a special content.

[38] PORTULANO 2016, p. 389.

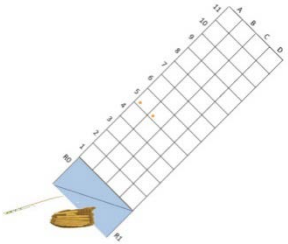
Catalogue number	V252 (almost entirely reconstructed from 5 fragments)
Inventory number	AP442+AP454+AP494+AP542+AP573
Graphic/Photographic Documentation	Pl. XXVIII, Fig. 97 Pl. VIII, Fig. 28 (Photo)
Provenance	R0
Description	Almost entirely reconstructed bowl, whit globular body and flat base. The everted rim is slightly thickened, with a rounded edge characterised by a groove that could be used as lid seat. The concave neck turns sharply into a prominent, decorated shoulder.
Decoration	Bundle of horizontal combed lines on the shoulder.
Fabric	Vessel surfaces are rough when rubbed with the thumb. Well-sorted, sharp-edge white rock grains are the most frequent inclusions. Smaller, ill-sorted, black rock grains are less frequent. Some small and medium voids, with irregular edges, are visible, both on the surface and in the core. Freshly broken fractures are regular as well as wall thickness. The vase was fired in a reducing atmosphere, resulting in a dark grey/blackish colour, that, however, is not homogeneous on the entire surface, suggesting uneven firing/cooling conditions.
Dimension	Rim diameter: 20 cm Bottom diameter: 11,2 cm Maximum height: 14,1 cm Maximum thickness: 0,9 cm
Production techniques	Wheel-thrown, as suggested by faint wheel-marks visible on both surfaces and by string-cut marks on the underside of the base.
Usage marks	Traces of a black substance, seemingly organic, inside, near the base. Faint burn marks on the body; horizontal sooting row on the outer surface, near the base.
Comparisons	DONATI 1979, p. 138, t. 58.3, fig. 267 REBAUDO GRECO 1980, Tav. XLVIII, 8 LAVIZZARI PEDRAZZINI 1980, pp. 222-224, Tav. 9 DELLA PORTA 1991, p. 169. Tav III, 3 BOLLA 1992-93 p. 256, fig. 11 *Antichi Silenzi,* p. 83, Tav. 17, t. 3, n. 5 ISTENIČ 2000, fig. 133, SKL/BO1 p. 144, Tav. 33, 5, t. 154; Tav. 33,7, t. 155 PRECCO ANCONA 2000, fig. 113, Variante A5

	CASARI 2002, p. 108, fig. 47 BRECCIAROLI TABORELLI, DEODATO 2011, Fig. 133, B2,3 PEŠIĆ 2014, p. 74, 16 e 1258 PORTULANO 2016, pp. 389-390, fig 4
Chronology	1st - 2nd century AD

V259/AP648+AP786 is the reconstructed base of a tripod cooking pot.
Forms of this type were used to cook food; burnt marks, limited only at the base of the short feet testify they were not used directly over the fire, but placed above hot embers[39]. In ancient literary sources this kind of cooking pot is called *tripus*[40].
Coarse ware tripods are not very frequent, however they are attested in a broad territory, comprehending nowadays Lombardy, Trentino Alto Adige, Austria, Slovene and beyond[41].
They are a long lasting shape: some scholars believe indeed that they derive from pre-Romans forms[42] but they have been found also in Late Antique - early Medieval contexts[43].
Dating them on the base of their morphological features turns out to be impossible since, despite the growing number of samples unearthed and published, their chrono-typological development has not been yet defined.
Two main morphological variants, each one more frequent in a limited area, are currently known.
The first one is characterised by larger, ribbon-shaped feet, starting from the centre of the base. *Tripus* belonging to this variant are more frequent in Northern provinces, with probable origins in *Noricum*.
The second variant, spread South of the Alps, presents smaller feet, in shape of a truncated cone, applied at regular distances along the base margin[44].
Stella 1 tripus belongs to this second variant. Samples from Trieste and Chiunsano, both located within *Regio X*, were dated between the Augustan age and the end of the 1st century AD. However, since no clear hints of this dating could be found for *Stella 1* sample, the broader

[39] RICCOBONO 2007, p. 114: "*La traccia scura del punto di appoggio sotto il peduccio mostra come questi tegami venissero posti su cumuli di braci e non su fuoco vivo*".
[40] See *Settefinestre 2*, p. 25 in the glossary, under the voice *Pentola*.
[41] For a first list of places where tripods are attested, see AVANZINI, BUSCHETTI *et Alii* 1994, p. 108, notes 114-115 and mentioned bibliography; a more complete overview of similar findings within nowadays Lombardy and neighbouring regions, with further bibliographical suggestions, is in *Ceramiche in Lombardia*, p. 160, *casserole* type 2.
[42] *Scavi MM3*, p. 198.
[43] Some samples have been unearthed still within a fireplace in the late antique *domus* identified in Casazza, in Bergamo districts (see LAVAZZA, VITALI 1994, p. 21).
[44] AVANZINI, BUSCHETTI *et Alii* 1994, p. 109.

chronology, between the second half of the 1st century BC and the 6th century AD has been cautiously adopted in the present work.
As mentioned before, *tripus* were solely meant to be used as cooking vessel; thus, even if V259/AP648+AP786 belongs to the main archaeological deposit, it should not be considered as part of the cargo, but more likely as an element of the board equipment.

Catalogue number	V259
Inventory number	AP648+AP786 (base reconstructed from 7 fragments)
Graphic/Photographic Documentation	Pl. XXVIII, Fig. 98 Pl. VIII, Fig. 29 (Photo)
Provenance	AP648:B5 Gamma 1 AP786: A5 
Description	Base of a tripod cooking pot. The three tiny feet are completely preserved; they are attached to a curved base. The walls are inclined outwards, suggesting an open, wide-mouth shape.
Fabric	Almost depurated fabric, characterised by very fine, well sorted and frequent inclusions; they are mainly small, sharp-edges white rock fragments (quartz?) and tiny flakes of glistering mica. Fine grains of *chamotte* could be seen, but they are less frequent. Several little voids are visible. The surface appears rough when rubbed with the thumb and freshly broken fractures are hackly. The colour is a homogeneous orange/brown and walls are extremely thin.
Dimension	Rim diameter: --- Bottom diameter: 12 cm Maximum height: 7,4 cm Maximum thickness: 0,5 cm
Production techniques	The vase seems to have been wheel-thrown as suggested by the extreme regular thickness of the walls. The three feet were separately modelled and then applied.
Usage marks	Burn marks resulting from sooting on both surfaces, but especially on the outer one.
Comparisons	Scavi MM3, p. 198, Tav. XCII, fig. 1-7 BOLLA 1992-93, p. 251, fig. 7, LAVAZZA, VITALI 1994, p. 21, Tav. I, 4. AVANZINI, BUSCHETTI *et Alii* 1994, p. 108, Tav. IV, 44 *Ceramiche in Lombardia*, p. 160, Tav. LXXIX, 2-4 *Trieste Antica*, p. 114, Tav. 28, fig. 41 CORTI 2016a, p. 98, fig. 1,16
Chronology	End 1st century BC - 6th century AD

Despite it is almost entirely reconstructed, no precise comparisons were detected for V260/AP26+AP83; its chronology and provenience remain in the dark.
It is a small, close container, with globular body. Its carrying capacity has been calculated in approximately 2 *sextarii* (i.e. 4 *heminae*)[45]. It has an unsafe, wobbling base, so it that could not be used to permanently store solid or liquid food. Failing a handle[46], it could not be even used to pour liquid.
It has been supposed that it was used as a pail, to draw content from bigger, but not easily accessible vases; however no explicit purpose can be defined.

[45] The precise value is 1,19 Liters, i.e. 2,17 *sextarii*.
[46] However it has to be noticed that traces of a possible joint of and handle with the body could be seen on the outer surface.

Catalogue number	V260 (almost entirely reconstructed from 6 fragments)
Inventory number	AP26+AP83
Graphic/Photographic Documentation	Pl. XXVIII, Fig. 99 Pl. VIII, Fig. 30 (Photo)
Provenance	D2 Delta 1
Description	Closed vase, probably a pitcher, with globular body and curved base. The rim is everted, slightly thickened. It is cut obliquely outwards and it has a flat edge. On the inner side there is a small groove, probably a lid seat. The neck is short and the passage between the rim and the body is underlined by a shrinkage. A circular irregularity is visible on the body; it could be interpreted as the trace of an handle attachment.
Fabric	Vessel surface is rough when rubbed with the thumb due to the presence of coarse and medium size, frequent inclusions. White and black, sharp-edges rock grains, and medium size grains of *chamotte* can be easily recognizable. Freshly broken fractures are irregular, while walls thickness is regular (0,8 centimetres on average). The fabric is grey/light brownish; the colour is homogeneous both on the surface and in the core.
Dimension	Rim diameter: 11 cm Bottom diameter: --- Maximum height: 14,1 cm Maximum thickness: 1,1 cm
Production techniques	The vase was wheel-thrown as suggested by the clear wheel-ridging on the inner surface.
Usage marks	Burn marks on the exterior surface, on the base and on the lower part of the body. Inside, at the base of the vessel, traces of a black substance, possibly organic.
Comparisons	None
Chronology	Unknown

6.8 Bases

A consistent number of *Stella 1* coarse ware vases are preserved only in the lower part, i.e. the base and the lower portion of the walls.
In some cases fabric and other technological features enabled to clearly identify the type of vessel they belong to. However, different pots could have been characterised by the same type of base, and it is particularly true for very simple shape; in the majority of cases, the lower part of the vase could not be considered useful to determine the vessel form.
For this reason, in the present work bases were taken into consideration only from a quantitative point of view; they were mainly used to determine the *minimum number of individuals* and to infer some general insights.
Stella 1 bases have been divided into three types, using as discriminating factor only major morphological features, easily detectable at a first glance.
Bases 1 gathers the majority of sherds, representing the simplest type. Within this group, vessels walls join the flat base creating a simple angle without any other peculiar feature.
Bases 2 are flat, even if in rare cases the underside could raise up toward the central point. Walls make a concave entry with the body, meeting the base almost vertically at the joining point. This results into a little shrinkage, located at the passage body-base.
Bases 3 gathers a small number of sherds, that could have different morphological features while they share an incised decoration on the exterior surface of the lower part of the body.
Lines are well marked and could be both horizontal and vertical; they are an intentional decoration and not simple traces of the production techniques.
V307/AP 405, V308/AP 1493, V309/AP 815, V310/AP633, V311/AP1310, V312/AP965 and V313/AP1448 cannot be related to any of the types so far presented since no portion of the walls was preserved; it was not possible either to reconstruct the diameter. Since they could not

provide any further information, both classification and catalogue cards have been omitted.
Across all the types, it has been possible to reconstruct the diameter of a number of pieces, mostly quite homogeneous, between 7,5 and 12 centimetres. The dimensions are compatible to medium size *ollae*, further suggesting that *ollae* represent the most frequent vessels within the area of scattered artefacts.
Necessary caution in approaching generic features prevented to relate these sherds to any specific form.
No attempt to find comparisons nor to assess the chronology has been made. Bases technological features suggests that they are all ancient materials, but in the majority of cases it is impossible to further shrink the chronology. For this reasons, the field *comparisons* and *chronology* have been removed from the following catalogue cards.
Bases have been divided into types using as discriminating factor only morphological features; pieces are not homogeneous within the three types and their fabric characteristics are going to be described in details, adding a dedicated field in the catalogue card.
Only the most meaningful and well preserved pieces were drawn and are going to be fully described; smaller and/or poorly preserved bases are listed, as usual, at the end of each type.

Bases 1

Catalogue number	V265
Inventory number	AP1228
Graphic/Photographic Documentation	Pl. XXIX, Fig. 100
Provenance	A7 Epsilon 1
Description	Small fragment of flat base, slightly thinned, with almost vertical walls.
Fabric	Orange fabric, characterised by sparse, medium and coarse inclusions, consisting mainly of white rock grains. Some voids are visible. Surface appears quite smoothed when rubbed with the thumb, probably as a result of a finishing technique; freshly broken fractures are quite regular.
Dimension	Rim diameter: --- Bottom diameter: 12 cm Maximum height: 3,5 cm Maximum thickness: 0,9 cm
Production techniques	Wheel-made as suggested by faint horizontal striations on the inner surface.
Usage marks	None

Catalogue number	V268
Inventory number	AP1205
Graphic/Photographic Documentation	Pl. XXIX, Fig. 101
Provenance	B7 Delta 1
Description	Fragment of a flat base and portion of the walls, probably belonging to a closed form.
Fabric	Vessel surface appears quite smoothed when rubbed with the thumb. It is characterised by coarse, sparse, ill-sorted white inclusions, mainly white grains, probably calcite; some voids could have been caused by the fading of the calcite during firing. Wall thickness is quite regular, as well as freshly broken fractures. The exterior surface is dark grey/black, while the interior one is beige, testifying for uneven firing conditions.
Dimension	Rim diameter: --- Bottom diameter: 9 cm Maximum height: 5 cm Maximum thickness: 1,2 cm
Production techniques	Some fingertip impressions on the inner side suggest that the vase was hand-made; however, regular disposition of inclusions testify it was finished on the wheel.
Usage marks	None

Catalogue number	V273
Inventory number	AP1455
Graphic/Photographic Documentation	Pl. XXIX, Fig. 102
Provenance	A9 Delta 1
Description	Eight matching pieces forming a flat base whose transition with the body is simple; a portion of the walls is preserved.
Fabric	Coarse dark brown/black fabric, whose surface appears quite smoothed when rubbed with the thumb. Frequent, ill-sorted, medium and coarse inclusions, mainly consisting of white, sharp-edges, rock fragments (quartz and calcite). Walls are very thin.
Dimension	Rim diameter: --- Bottom diameter: 10,6 cm Maximum height: 6,2 cm Maximum thickness: 0,7 cm
Production techniques	The vessel is wheel-thrown, as suggested by the faint wheel-ridging visible on both surfaces. The base was made separately, and then attached to the rest of the vase.
Usage marks	None

Catalogue number	V279
Inventory number	AP1305
Graphic/Photographic Documentation	Pl. XXIX, Fig. 103
Provenance	D7/L
Description	Little base, entirely preserved, belonging to a small closed vessel. The base is not completely flat, but it is slightly raised toward the centre.
Fabric	Grey fabric, quite rough when rubbed with the thumbs. Fine and medium size inclusions, mainly white, sharp-edges, rock fragments are frequent and well sorted. Freshly broken fracture is quite hackly; wall thickness appears regular.
Dimension	Rim diameter: --- Bottom diameter: 7,4 cm Maximum height: 3,6 cm Maximum thickness: 1,2 cm
Production techniques	The string cuts on the underside of the base and the faint wheel-marks visible on the inner surface testify that the vase is wheel-thrown. Wheel-ridging is particularly evident on the inner side of the base.
Usage marks	None

V261/AP 1485, V262/AP13390+AP1696, V263/AP1119, V264/AP913, V266/AP1341, V267/AP1354), V269/AP708, V270/AP1123, V271/AP556, V272/AP1138, V274/AP1336, V275/AP1015, V276/AP73, V277/AP45, V278/AP42+AP307, V280/AP1298), V281/AP1206, V282/AP1411, V283/AP1421, V284/AP402, V285/AP1446, V286/AP208, V287/AP1373, V288/AP71, V289/AP1398, V290/AP1501, V291/AP191, V292/AP98+AP101 and V293/AP349 belong to this type.

Bases 2

Catalogue number	V316
Inventory number	AP239
Graphic/Photographic Documentation	Pl. XXIX, Fig. 104
Provenance	C4 Epsilon 5
Description	Base and body of a closed vessel almost entirely reconstructed from 17 fragments. The base is flat; at the junction point with the body is visible a small shrinkage.
Fabric	Coarse brownish fabric, characterised by medium and coarse, frequent, well-sorted inclusions, mainly consisting of quartz and calcite grains. Surface is rough when rubbed with the thumb and freshly broken fractures are irregular. Walls appear extremely thin and the colour is quite homogeneous.
Dimension	Rim diameter: --- Bottom diameter: 11,2 cm Maximum height: 12,5 cm Maximum thickness: 0,2 cm
Production techniques	The regular reduced thickness of the walls suggests that the vase is wheel-thrown.
Usage marks	None

Catalogue number	V296
Inventory number	AP409
Graphic/Photographic Documentation	None
Provenance	C4
Description	Fragment of a flat base and portion of the lower part of the body. The junction base/body is characterised by and evident shrinkage.
Fabric	The vessel surface appears rough when rubbed with the thumb due to frequent, coarse, sharp-edges white inclusions, seemingly calcite. Freshly broken fractures are irregular, as well as wall thickness. The colour is a quite homogeneous dark grey, suggesting a firing in reducing atmosphere.
Dimension	Rim diameter: --- Bottom diameter: 10,8 cm Maximum height: 5,7 cm Maximum thickness: 1 cm
Production techniques	The vase seems to be hand-made, with the coiling technique; on the inner surface is possible to see some little grooves, resulting from the joining of the coils. However, the quite regular aspect of the outer surface suggests that it was then finished on the wheel.
Usage marks	Traces of a black substance, seemingly of organic nature, on the interior surface, at the joining point body/base.

V294/AP1678, V295/AP1246, V297/AP1099 and V298/AP1105 share the same morphological features and can be identified as bases 2.

Bases 3

Catalogue number	V302
Inventory number	AP947
Graphic/Photographic Documentation	None
Provenance	D5
Description	Small fragment preserving the beginning of the base and a portion of the vessel body, whose external surface is decorated. The junction base/body is simple.
Decoration	Combed composite decoration, consisting of some horizontal lines in the lowest part, at the junction base/body. The rest of the wall, in the preserved portion, is decorated by combed vertical lines.
Fabric	Vessel surface is smoothed when rubbed with the thumb. The beige fabric is characterised by medium size and fine inclusions, quite frequent and well-sorted. Some glistering flakes of mica are visible on the surface. Walls thickness is quite regular.
Dimension	Rim diameter: --- Bottom diameter: 11,6 cm Maximum height: 2,9 cm Maximum thickness: 0,8 cm
Production techniques	Wheel-thrown, as suggested by the smoothed surface and by the regular walls thickness.
Usage marks	Burnt marks (maybe due to uneven firing conditions) on the exterior surface.

Catalogue number	V305
Inventory number	AP848
Graphic/Photographic Documentation	None
Provenance	D6
Description	Small fragment of flat base simply joined with the preserved portion of the walls, decorated on the exterior surface.
Decoration	Vertical lines incised with a comb, starting from the junction body-base.
Fabric	Grey fabric, characterised by fine and medium size inclusions, sparse and ill-sorted. They are mainly sharp-edge white rock grains. Vessel surface appears quite smoothed when rubbed with the thumb; freshly broken fractures are regular.
Dimension	Rim diameter: --- Bottom diameter: 13 cm Maximum height: 2,9 cm Maximum thickness: 0,9 cm
Production techniques	Hand-made, as suggested by fingertip impressions on the inner side, mainly visible at the junction body/base. The vase was then finished on the wheel, as suggested by the regular disposition of inclusion on the exterior.
Usage marks	None

V299/AP264, V300/AP1695, V301/AP1688, V303/AP737, V304/AP940 and V306/1124 are characterised as well by an incised decoration on the exterior surface and they thus belong to bases 3 type.

V314/AP1531+AP1589+AP1596 can be included into base 1 but an individual discussion for one peculiar feature is in order.
The flat base, completely reconstructed, is characterised, on the underside, by an embossed stamp, consisting of four dots enclosed within a rectangle.
Embossed anepigraphic stamps are quite common in the territories of nowadays Friuli Venezia Giulia during the *Romanization* period[1].
They are usually associated with ovoid *ollae* with everted, slightly thickened rim, and pronounced shoulder, that appeared in the second half of the 2nd century BC and continued to be used till the end of the Republican era, even if some samples survived into the Augustan age[2].
These *ollae*, usually fired in oxidising atmosphere and realised with a fabric rich in small, irregular, calcite grains, were mainly hand-made, while the base and the rim were finished on the wheel. They have been described as type 38 in G. Gambacurta's classification[3], corresponding to type FVG 5 in P. Donat's work[4].
They are attested in a restricted area of the Northern-Adriatic arch, from nowadays eastern Veneto (Oderzo, Altino and Montebelluna[5]) to Slovene; they have been found in a number of settlements, like Montereale Valcellina, Zuglio and at the mouth of the *Timavo* river. Some samples were unearthed along main commercial roads or around Alpine passes, like at San Giorgio di Nogaro, along the *via Annia*, or on Mount Nanos, the ancient *Ocra*, in nowadays Slovene[6].
Distribution area and chronology suggest that vases with an embossed anepigraphic stamp appeared firstly in nowadays eastern Veneto. The earliest samples were unearthed in Oderzo; some scholars supposed

[1] For the most recent synthesis, with an updated list of attestations, refer to DONAT 2016a and mentioned bibliography.
[2] SPANGHERO, VITRI *et Alii* 2002, c. 772: "*Questo tipo di marchi anepigrafi, presenti su olle con orlo svasato, labbro ingrossato, spalla leggermente carenata e corpo ovoidale, trovano confronto nell'età della romanizzazione*".
[3] GAMBACURTA 2007, pp. 107-108.
[4] DONAT 2010, vol. II, pp. 101-105.
[5] The most comprehensive overview for nowadays Veneto could be found in the work by G. Gambacurta: see GAMBACURTA 2007, pp. 46-47.
[6] See DONAT 2000, p. 122, in particular the preliminary distribution map in fig. 2, and mentioned bibliography.

that they were firstly produced there[7] and they were later spread in all Northern Adriatic arch, along the routes followed by *Romanisation* process[8].

At the present state of the art, vases with embossed stamps are mainly attested in nowadays Friuli Venezia Giulia; a possible local production could be located in the pottery kiln of Locavaz, at the mouth of Timavo river, a production site for *ollae* Gambacurta 38/Donat FVG 5 during Republican age; however, so far, no anepigraphic stamps have been unearthed at this site[9].

Stamps are always embossed on the underside of the vessels base; it is likely that they were engraved on the potter's wheel. Alternatively, a movable support could have been add to the wheel when needed[10].

No differences, neither morphological or technological, can be found between pots with or without embossed stamp; furthermore, only a small number of ever recurring stamps are attested[11].

The function of these stamps is not yet clear and countless hypothesis were made, taking into consideration a variety of factors.

G. Cassani proposed to read them as labels for ritual vases because in Sevegliano several stamped *ollae* were found in a cultural context together with some other ritual objects[12]. However the majority of stamped *ollae* come from settlements and therefore they were used in everyday life.

Other authors suggested that stamps could be related to vases production. They could have been used to pinpoint the centre of the wheel, or to sign personal working tools in a shared workshop. In this case the correlation between embossed stamps and the peculiar pot remains in the dark[13].

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[7] BUORA 2001, p. 168.

[8] DONAT 2016a, p. 257.

[9] DONAT 2010, vol. II, p. 103.

[10] VENTURA, DONAT 2003, c. 408: "*Il marchio a rilievo sul fondo esterno presuppone che questo fosse inciso in negativo sul disco del tornio, o comunque su un supporto fissato al tornio stesso*".

[11] DONAT 2016a, p. 259: "*Un'altra peculiarità di questo tipo di bollatura è che la ripetitività dei marchi ha una frequenza non molto alta e che questi sono presenti solo su un numero piuttosto basso di contenitori*".

[12] *Sile e Tagliamento*, p. 408.

[13] DONAT 2016a, p. 263.

Anepigraphic stamps cannot be correlated with signs of trade, nor as content marker or guarantee seal, as other marks or incised inscription visible over different kinds of trade containers[14]. Since they are always on the underside of the base, they wouldn't be visible, being thus useless for these commercial functions.

The most likely explanation was proposed by G. Gambacurta, who approached them to the production cycle and read them as distinguished mark of specialised workshop within a well organised production system[15]. Furthermore, stamps could have had a functional role during the productive phases, i.e. they may have marked, inside a larger production, a specific batch of goods[16].

In her most recent work P. Donat spotted a relationship between simpler marks associated with smaller *ollae*, and more complex stamps, recurring mostly on medium size *ollae.* The classification was based however on a small number of samples; more stamps on almost entirely preserved vases are needed to further prove the coherence of this relationship[17].

The *Stella 1* mark can be associate with Donat's *stampo di tipo 1*, a type that gathers the simplest stamps, characterised by an embossed rectangle, empty or enclosing a single dot, sometimes with departing lines. However, no perfect match has been found, neither in this work, nor in the current literature.

The *Stella 1* sherd is so poorly preserved that it could not be related to any peculiar shape; however embossed epigraphic stamps are restricted to *ollae* Gambacurta 38/Donat FVG 5. It is safe to include this fragment into these *ollae*. Fabric characteristics are similar to vases produced at the Locavaz pottery kiln; however no archaeometric analysis was possible, thus the similarity has been only macroscopiccaly observed.

[14] MAZZOCCHIN, AGOSTINI 1997, p. 137.

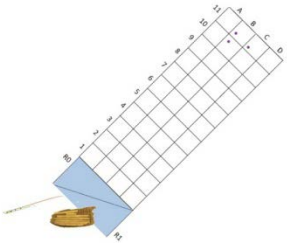
[15] GAMBACURTA 2007, pp. 107-108.

[16] See MARITAN 2015, p. 256: "*È possibile ipotizzare si possa trattare di un segno distintivo funzionale all'interno dell'impianto produttivo per diversificare e riconoscere il prodotto rispetto agli altri, forse per distinguere all'interno di un'infornata una specifica partita di recipienti*".

[17] DONAT 2016a, p. 265.

The pot can be dated between the second half of the 2nd century BC and the Augustan age, when embossed epigraphic stamps disappeared.
Embossed stamps will return in this area in late Antique - early Medieval period, but they will be more complex, and linked to Christian symbolism[18], thus completely different from the one on *Stella 1* base.
The matching fragments that composed V314/AP1531+AP1589+AP1596 were collected in a restricted zone of the area of scattered artefacts at some distance to the remaining of the hull. This and the early chronology might be a sign for an earlier piece, already in place when the archaeological deposit was formed.

[18] Later stamps are mainly encircled crosses and similar motifs. A full analysis of this later *phenomenon* can be read in LUSUARDI, NEGRI 2007, whit a rich bibliography and an updated lists of the main samples recovered all around the attestation area.

Catalogue number	V314
Inventory number	AP1531+AP1589+AP1596
Graphic/Photographic Documentation	Pl. XXX, Fig. 105
Provenance	AP1531: B10 Epsilon 1 AP1589: B11 AP1596: C11 Beta 2 
Description	Flat base completely reconstructed from three fragments; very few remains of the walls. The underside of the base is characterised by an embossed stamp consisting of a four circular embossed dots grouped into an otherwise empty rectangle.
Fabric	Brownish/greysh fabric, with frequent, ill-sorted, medium size and coarse inclusions, mainly consisting of rock fragments. Many irregular voids, of different dimensions, are sparse on the exterior walls. The surface appears rough when rubbed with the thumb and freshly broken fractures are irregular.
Dimension	Rim diameter: --- Bottom diameter: 9,2 cm Maximum height: 1,8 cm Maximum thickness: 1,2 cm
Production techniques	The vase seems to be wheel-thrown, as suggested by the faint wheel-ridging visible on the inner surface.
Usage marks	None
Comparisons	The most recent list of vases with embossed anepigraphic stamps is in DONAT 2016, with a distribution map of the samples.
Chronology	From the second half of the 2nd BC to the early Augustan age.

Chapter 7

Coarse ware distribution and trade. Abstracting from *Stella 1* case study

7.1 *Stella 1*: nature and chronology of the archaeological deposit

The first issue to be solved when dealing with materials collected within the *Stella 1* area of scattered artefacts was the assessing of the nature of the archaeological deposit, to understand the relationships among the materials brought to light there and to insert the area into the broader framework of the *Stella 1* site as a whole.
The analysis of coarse ware provided information towards a better comprehension of the nature of the site, further supported by *data* retrieved from the preliminary study of the other archaeological materials[1].

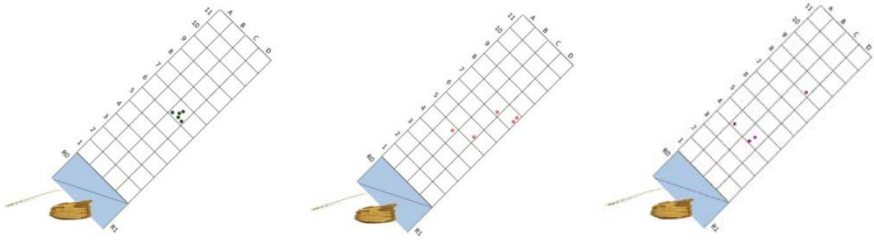
[1] The preliminary results of the study of other archaeological materials collected in the area of scattered artefacts have been extensively presented in chapter 3, pp. 34-68.

The distribution of coarse ware within the archaeological deposit confirms that the area of scattered artefacts has to be considered a homogeneous context.

Coarse ware fragments are spread all over the underwater archaeological deposit; furthermore sherds belonging to the same vessel were frequently found in different excavation squares within the area of scattered artefacts.

In joining matching fragments in order to determine the *minimum number of individuals*, several vessels were reconstructed joining pieces frequently collected in different excavation sectors, even at great distance from each other; it is not rare that sherds belonging to one individual were collected during underwater excavations performed in different years.

Situations vary for different vases. In some cases the entire form was reconstructed from sherds collected very close to each other (see *figure 1a*); some units were recomposed from fragments found scattered all around the investigated area (see *figure 1b*); finally, some forms reassembled from pieces discovered in the same sector were completed by a single fragment found elsewhere (see *figure 1c*).



1a *1b* *1c*

Fig. 1. Source of fragments belonging to the same vase. In 1a the case of a vase reconstructed from pieces found close to each other; in 1b, a vase recomposed from fragments collected in different zones of the area of scattered artefacts; in 1c, a shape completed by a fragment collected in an area detached from the one where the other pieces were unearthed. (author's elaboration)

Generally speaking, it is possible to indicate, within the area, two zones characterised by a higher concentration of artefacts (see *figure 2*).

One is in R0, immediately near the hull remains. This is a very interesting *datum*, since it suggests a strict relationship between

materials recovered from the hull and its immediate surroundings, and the ones brought to light within the stream of artefacts.

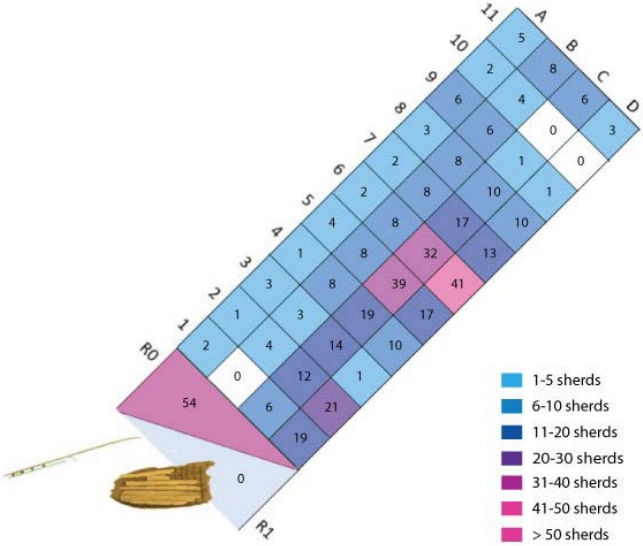


Fig. 2. Concentration of coarse ware fragments in the squares excavated during 2013-2016 campaigns. (author's elaboration)

The other one coincides with the squares C2 to C8 and D2 to D8. Two hundred and fifty six fragments were recovered here, more than one third of the total. In this case, it is difficult to figure out the reason(s) for this uneven distribution that still remains unsolved. Further information cannot be retrieved from other materials, which seem to be characterised by this same kind of distribution.

Objects location and their relations to each other provide information about the formation process of the archaeological deposit.

The presence of matching pieces detached one from another is highly dependent on post-depositional processes, both natural, like the continuous flow of the river and/or minor movements of the river flow, or caused by the presence of men and the exploitation of the watercourse.

Moreover, it has to be reminded that the archaeological deposit lies only 6 meters under the water surface and that the river is highly frequented by divers for sports, that definitely have visited the site and potentially are responsible for the dislocation of pieces.
The *Stella/Anaxum*, like other watercourses whose origin is an underground spring, is characterised by a low river sediment transport and by a constant, though slow, water flow[2].
The current river bed has not suffered from an evident change in shape since Roman times and the river's course has always been stable, since it is not affected by periodical floods[3]. Thus, the concentration of archaeological objects in the area of the *Stella 1* site cannot be considered the result of an accidental and natural process, such as sedimentation. The good state of preservation of the materials (some objects were collected almost intact) and the fact that in most of the cases interrelated finds were collected close to each other, cannot have been caused by the intrinsic variability of a natural process.
Such a high concentration of materials is registered only in this portion of the watercourse, while other areas have so far produced, at most, isolated artefacts.
The concentration of materials and the formation of the archaeological deposit cannot be considered the result of the accidental and continuous flow of the water that gathered artefacts previously scattered in different parts of the river.
The homogeneity of the context is further supported by the chronology. Chronological assessment for the various coarse ware types has been thoroughly addressed in different sections of the catalogue[4]. Here it is worth mentioning that the majority of the artefacts dated back to a time between the second half of the 1st century AD and the end of the 2nd century AD.

[2] FONTANA 2006, p. 41.
[3] FONTANA 2006, p. 221.
[4] For an overview of the chronology identified for the majority of the pieces, see the tables in *Appendix III. Tables of chronologies,* pp. liv-lxxiv, and particularly the last one, that summarizes the chronology of *Stella 1* coarse ware (see pp. lxvii-lxxiv).

This chronology corresponds with the one issued by the other materials collected in the area of scattered artefacts[5]. The homogeneity of the deposit is therefore confirmed from a chronological point of view as well, further proving that most of the materials reached the river bed simultaneously, and underwent the same post-depositional processes.
The archaeological deposit contains a small number of earlier and later artefacts that have to be considered intrusive materials. Nevertheless, they are worthy of mention since they confirm the uninterrupted and continuous human frequentation of the *Stella/Anaxum* river, highlighting the importance of this area from prehistoric times to the Middle Ages.
As a result, the complete study of coarse ware, flanked by *data* retrieved from the preliminary studies of the other materials, demonstrates that the area of scattered artefacts constitutes a homogeneous assemblage, from both a compositional and a chronological point of view.
Broadening our sights to the entire *Stella 1* site, materials from the area of scattered artefacts showed a composition which is very similar to the one recovered in the nineteen eighties directly from the hull.
Both among the materials collected from the hull and among the ones brought to light from the area of scattered artefacts, bricks and tiles constitute the bulk of the assemblage, followed by amphorae and coarse ware, while finer productions, such as *terra sigillata* or lamps, as well as other objects pertaining to the *instrumentum domesticum*, represent only a small percentage of the total.
Also the chronology fits, since materials collected during earlier excavations from the hull and in the immediate surroundings were dated to the 1st century AD[6].
Homogeneity is further sustained by the most recent radiocarbon dating of the hull, carried out under the *Sutiles Project* in 2014, that gives a finally assessment of the chronology of the barge as the second half of the 1st century AD[7].

[5] See chapter 3 (pp. 34-68), and especially the summarizing chronological table in 3.9, pp. 60-68.
[6] VITRI, BRESSAN *et Alii* 2003, p. 330.
[7] CAPULLI, CASTRO 2016, p. 38.

The area of scattered artefacts has a strong relation with the hull remains and the Roman finds collected on the barge and in the immediate surroundings; the two sources of evidence are intertwined elements of a composite, but contemporary and homogeneous, archaeological site.
Further investigations are needed, but the most likely explanation for the connections between the area of scattered artefacts and the hull is that the fluvial barge wrecked probably because of a flood or some other natural cause, spilling its cargo as it drifted downstream.
Nevertheless, it is not sure whether all the finds lying in the area of scattered artefacts belonged to the cargo of the vessel whose wooden remains still lays on the river bed.
Only a small portion of the barge, a little more than 2 meters wide is preserved; no other fragments of the boat, except for the front part of the hull, has been recovered and the original length of the vessel is still unknown. Materials collected directly from the hull suggested that the cargo was stacked on the ceiling planks to a height of about 60 centimetres. The vessel sides must have been 70-80 centimetres in height and the boat fully loaded should have had a draft of about 25 centimetres[8].
The stream of artefacts has brought back almost nine thousand kilos of finds; even excluding earlier and later finds, not connected with the hull, the high number of artefacts appears, at first glance, to be not entirely compatible with the dimensions of the hull.
Nevertheless it is worthwhile remembering here that Roman flat-bottom ships with a shape similar to the *Stella 1* barge have been found in several sites of the Northern Provinces of the Roman Empire, along the Rhine and Rhonê rivers[9]. Recent research in nowadays Croatia and

[8] CAPULLI, CASTRO, FOZZATI 2012, p. 19.

[9] A comparative and up-to-date study of several Roman *prams* recovered in the rivers and lakes of Roman *Gaul* and *Germania* and dated from the 1st to the 3rd century AD is contained in BOCKIUS 2004. The author, relying on detailed technical ships investigations, calculated load capacities. Such vessels, comparable to the *Stella 1* flat-bottom barge, were characterised by relative high cargo capacities. These results confirmed that these ships were used to carrying heavy loads even on long distances, exploiting mainly inland waters (see particularly BOCKIUS 2004, p. 109 and mentioned bibliography).

Slovene brought to light a number of fluvial barges, some of them built following the same *sewing* technique already described for the *Stella 1* hull. These fluvial ships used to sail major and minor rivers, connecting the Eastern provinces of the Roman Empire with the Aquileia's territory[10].

Scholars now acknowledge that these flat-bottom fluvial barges were used, mainly, to transport heavy loads, especially to supply Roman military camps of both wholesale provisions and/or building materials.

It cannot be excluded that even a small barge, like the *Stella 1*, could have been used for large scale transport, reducing its speed and manoeuvring capabilities while adding to the danger of capsizing. Therefore, it is possible that the majority of materials from the area of scattered artefacts belonged to the barge and formed part of the cargo.

Hypothetical reconstructions for several length and cargo configurations, based on the measures of the preserved ship portions and on the artefacts' weight, are being currently elaborated by Professor M. Capulli in cooperation with the Texas A&M Nautical University, in order to assess the most plausible range of sizes of the original *Stella 1* barge[11].

The results of these naval engineering calculations, flanked by the complete exploration of the area of scattered artefacts, will definitively

[10] Just to quote some samples, it is worthy to mention here some of these finds, that turned out to be important also because they prove the existence of riverine trade from and toward the Aquileia's *ager*. At the end of the 19th century AD the remains of wooden barge were found in Lipe, nowadays Slovenia. The barge, recently studied and published, is dated to the 1st century AD; it was suited for carrying merchandise and men on the Ljubljanica river, linking Aquileia to the Save and the Danube (See BOETTO, ROUSSE 2011 and mentioned bibliography). The fluvial barge discovered at Sisak, in nowadays Croatia, built following the same *sewing* technique adopted also for the *Stella 1* ship, is more recent, being dated between the second half of the 2nd century AD and the first half of the 3rd AD (See GASPARI *et Alii* 2006). Another vessel similar to *Stella 1*, both for the construction technique adopted and for the composition of the cargo, mainly consisting of building materials, is the one recently excavated within the Kupa river, in modern Croatia. The barge, whose radiocarbon dating suggested a chronology between the 1st and the 3rd century AD, was transporting a cargo of several *sesquipedalis*, found *in situ*, within the barge's hull (see ZUBČIĆ, BOETTO, DIVIĆ 2017).

For an overview of this kind of ships discovered in the Northern Adriatic arch, see BELTRAME 2002.

[11] CAPULLI, CASTRO 2016, p. 39.

determine whether all the materials were part of the same cargo or whether the presence of more than one barge, wrecked in the same portion of the river, approximately in the same time-frame should be hypothesized.
Nevertheless, the homogeneity of the contexts, flanked by the above described features of the materials, undeniably confirms that the site can be read as a snapshot of a trade during its realization.

7.2 *Stella 1* coarse ware: a traded good

Evidence discussed above confirms that *Stella 1* is a site of a commercial nature; the artefacts recovered there must be approached as traded goods.
Percentages show that the bulk of the cargo was made up of bricks and tiles. It is worth noting here that names on the stamped bricks confirm that building materials made by different producers were transported together within the same batch. Most of these materials were locally produced in workshops located along the river banks, but they reached external, even distant markets, since similar stamps are scattered all along the Northern Adriatic arch[12].
Considering coarse ware, some forms, such as those of beakers or bowls, were more likely part of the on board equipment, or personal belongings of crew members[13].
However, the majority of *Stella 1* coarse ware is made up of *ollae*; a number of two hundreds and twenty-nine vases can by no means be interpreted as belonging to the on board equipment of a fluvial barge like *Stella 1*, that regularly sails along the banks of a river or near the shorelines, when used for navigating in lagoons. The crew was only a

[12] See chapter 3.1, pp. 37-43.
[13] See the introduction to the different types provided in the catalogue for a detailed explanation of the reason(s) why some types are clearly part of the cargo while some others cannot be considered as traded goods. The first and most telling hints is surely the number of artefacts; single vases, or forms attested by a restricted number of samples are less likely to be object of commerce.

small number even in the case the boat was moved at times with oxen or horses along the river trail. These *ollae* therefore testify that coarse ware was traded along the *Stella/Anaxum* river and that it constituted an important traded good of the *Stella 1* cargo.

Disregarding earlier and later materials, as well as objects that were not part of the cargo, the attention was focused on *ollae* types that show clear indications of being traded products, since their study has enabled the answering of questions that have stimulated research from the very beginning. Aside from typological clues to coarse ware transport containers, *Stella* 1 traded *ollae* have also provided important information for reconstructing the commercial and economic system of the *Stella* basin and linked territories during Roman times.

Ollae 1, *ollae 2*, *ollae 7* and *ollae 8*, as fully demonstrated in dissertations dedicated to each of these types[14], were surely part of the cargo.

Four main arguments for their use as transport containers for shipping foodstuff can be listed. First of all, the relatively high number of samples belonging to each of these types confirms that they were a commercial batch. Traces of a black organic substance covering the internal surface suggest that they were full at the moment of the wreck while the standardization in modular sizes confirms that these coarse ware *ollae* were traded as food containers. The diffusion all over Northern Italy and beyond, always maintaining the same morphological and dimensional characteristics, testifies a correlation between shape and content that must have been of easy reading for both merchants and consumers.

Ollae 9 should be considered as traded goods as well. In this case their nature as commercial objects is suggested not by the *Stella 1* materials themselves (*ollae 9* are indeed represented only by an extremely reduced number of samples), but by taking into consideration the extensive literature concerning this kind of *ollae*, that clearly demonstrates their function as food containers, to ship foodstuff collected during Summer in the meadows of the alpine slopes[15].

[14] See chapter 6.1.1, pp. 149-157, chapter 6.1.2, pp. 183-188, 6.1.7, pp. 258-259, and 6.1.8, pp. 276-279.

[15] See chapter 6.1.9, pp. 289-304.

Stella 1 ollae testify that coarse ware entered commercial routes, but the trade, rather than concerning the container itself, involved its content instead.
This, in addition, is a pattern already known for different ancient productions: disregarding the most important example that is the one of the amphorae, also the *pôt a garum*, as well as some peculiar glass shapes[16], entered the Roman system of trade merely as food containers.
If the *ollae* function and purpose could be identified through quantification, first the number of vases, second the standardized sizes related to their content, the transported good is far more difficult to be determined.
Some hints were retrieved considering the nature of foods. Even if it is true that in antiquity some foodstuffs could be preserved and lasted for quite a long time, it is nevertheless unlikely that long distance trades could have involved highly perishable goods.
Chilled foods should be excluded, because their circulation should have been mainly local; while preserved food products, such as cheese, or salted/smoked meat, dried fruits and/or vegetables could have been shipped and exported even on a large scale[17].
Some shapes, such as for example *ollae 1* and *ollae 8*, were produced by a large number of local workshops that maintained unchanged morphological and technological features, likely because they were immediately recognisable by producers, traders and consumers since they gave a clear idea as to their content. The correlation between content and containers manufactured in workshops distant over 200 kilometres from each other indicates that the foodstuff associated with these productions was not a typical product of a specific area, but rather a foodstuff that may have been produced in a quite broad territory.

[16] See chapter 3, p. 53 for evidences of the use of some *Isings* 50 glass bottles as oil containers.
[17] See BANDELLI 2009, especially p. 394, and mentioned bibliography, for a theoretic framework about the circulation of perishable goods in the territory of the Roman *Cisalpine Gaul*.

Suggestions about possible contents can come from browsing ancient literary sources, that now and then, and never in a systematic way, mention peculiar foodstuff produced in a specific area.
Ancient authors list certain renowned foods produced within *Regio X*, whose characteristics made them suitable for medium-long distance trade.
Northern Italy is remembered by both Pliny the Elder and Strabo for the fertility of its lands, that have a variety of fruits and flowers; these territories, not only excellent farmlands, were also famous for the complementary activity of beekeeping. Honey is frequently nominated as a high quality delicacy produced in the territories North of the river Po[18].
Pliny the Elder wrote that the inhabitants of the *vicus* of *Hostilia*, near Padova-*Padua,* within the border of *Regio X*, invented a peculiar method for beekeeping. Since their territory lacked wide areas characterised by the variety of flowers needed to produce high quality honey, they used to load the beehives onto large fluvial barges, travelled upstream the river Po for several miles until they reached fields where the bees were let free to collect nectar.
They then returned to their city, to extract and produce a delicious variety of honey that could be traded exploiting the same waterway used to feed the bees[19].
This is an interesting piece of information, given that the river Po also seems to have been one of the preferential routes followed by certain coarse ware *ollae*.
The territory of Aquileia was also furnished with honey produced in the surrounding hill settlements: Strabo, speaking about the populations of the *Noricum*, states that they lived in a territory unsuitable for wheat growing and therefore they had to trade with people from the flatlands in order to fulfil their need of foods and other

[18] BORTOLINI 2008, p. 48.
[19] *N.H., XXI,* 37, 73: "*Mirum est dignumque memoratu de alimentis quod conperi. Hostilia vicus adluitur Pado. huius inquilini pabulo circa deficiente inponunt navibus alvos noctibusque ad quina milia passuum contrario amne subvehunt. egressae luce apes pastaeque ad naves cotidie remeant mutantes locum, donec pondere ipso pressis navibus plenae alvi intellegantur revectisque eximantur mella.*"

goods. In exchange for these products, they could provide resin, pitch, torch-pine, wax, honey, and cheese[20].

It is meaningful, once again, to mention honey in connection with one of the routes followed by coarse ware vessels, headed in this case towards the Northern provinces. It is true that these pots were produced South of the Alps; however, they could have been used for retail commerce, after having received the food from Northern provinces in perishable containers, most suitable for larger quantities.

Ollae are perfect containers for honey; they are indeed characterised by a sufficient wide mouth, usually with an everted rim that would ease the pouring of the contents. Necks are never that narrow, and therefore enable reaching inside the pot, facilitating access to the content. The ovoid or globular body hosted a reasonable quantity of food, to be used while avoiding any waste, and the flat base ensured the stability of the pot itself[21].

If honey seems to have been an imported commodity, literary sources also testified to certain peculiar goods produced within the Aquileia's *ager*. The countryside surrounding Aquileia is described by Herodian as rich in planted trees that sustained grapevines[22] and fruits from this territory were mentioned by other authors as one of the most common local goods, harvested in abundance for export[23].

Already in the 1st century AD Columella mentions *mala matiana*[24], a recipe made with apple, honey and wine. Atheneus states that they are a typical product of a small town at the foot of the Alps, near Aquileia;

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[20] STRABO, *IV*, 6, 9: "*ατὰ σπάνιν οὖν τροφῆς τε καὶ ἄλλων ἐφείδοντο ἔσθ' ὅτε τῶν ἐν τοῖς πεδίοις, ἵν' ἔχοιεν χορηγούς· ἀντεδίδοσαν δὲ ῥητίνην πίτταν δᾷδα κηρὸν τυρὸν μέλι· τούτων γὰρ εὐπόρουν.*"

[21] A detailed description of the qualities of the perfect honey container is provided in BORTOLINI 2008, p. 109.

[22] HEROD., 8.4.5

[23] VEDALDI IASBEZ 2007, p. 55.

[24] COLUM. *XII*, 47, 2-5: "*Nihil tamen certius aut melius experti sumus, quam ut cydonea maturissima integra sine macula et sereno caelo decrescente luna legantur et in lagona nova, quae sit patentissimi oris, detersa lanugine, quae malis inest, conponantur leviter et laxe, ne collidi possint;*(…) *tum quam optimo et liquidissimo melle vas usque ad summum ita repleatur, ut pomum summersum sit. Haec ratio non solum ipsa mala custodit sed etiam liquorem mulsi saporis praebet, qui sine noxa possit inter cib[i]um dari febricitantibus* (…) *Itaque possint etiam alia genera malorum sicuti orbiculala, Ces< t> ian.a, melimela, Matiana<s>, hoc liquore custodiri*"

but he also informs that it was sold in Rome, testifying that these foodstuffs were traded even over long distance[25].
This food product remained a well-known and luxurious good, and it is mentioned still in the 4th century AD in Diocletian *Edictus de maximii pretiis*[26]. It must have been a massive and/or luxurious traded good if at the beginning of the Late Antiquity the Emperor felt the need to control its price[27].
Neither literary sources nor the archaeological record suggest which kind of containers were used to store and trade *mala matiana*[28], therefore there is no reason to link *mala matiana* to coarse ware pots. Nevertheless, these quotations from ancient literary sources are interesting for the purposes of the present work because they testify the existence of a perishable good, produced in the territory surrounding Aquileia, whose trade actually reached Rome and was so important that the central State authority needed to impose price controls.
An interesting hint that seems to suggest a link between agricultural products and coarse ware comes from *Stella 1* materials themselves.
Within the *Stella/Anaxum* basin, along the river banks or at important road-crossings, a number of *villae rusticae* that hosted within their premises pottery workshops have been identified in the past years. Some of them revealed archaeological evidence of the production of coarse ware shapes[29]. Further proof that could come only through a systematic excavation of the archaeological remains, completed and sustained by archaeometric analysis of the pottery finds, is needed.

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[25] ATHEN., *Deipnos.*, *III*, 82c: "*Ἐγὼ δ΄,ἄνδρες φίλοι, πάντων μάλιστα τεθαύμακα τὰ ⟨κατὰ⟩ τὴν Ῥώμην πιπρασκόμενα μῆλα τὰ Ματιανὰ καλούμενα, ἅπερ κομίζεσθαι λέγεται ἀπό τινος κώμης ἱδρυμένης ἐπὶ τῶν πρὸς Ἀκυληίᾳ Ἄλπεων.*"
[26] *Ed. de pretiis*, 6.65: "*mala optima Mattiana sive Saligniana n. X: (denarii) q[u]attuor*".
[27] For a detailed description of *mala matiana,* especially in relationship to the territory of Aquileia, see BUORA 2003, p. 120.
[28] Columella speaks about a *lagoena*, but it should be approached just as generically mentioned since the proper *lagoena* is a narrow neck jar, that by no means would have been able to contain apples.
[29] An overview of the *Stella/Anaxum* basin *villae rusticae* equipped with pottery production facilities has been already provided in chapter 2.2, pp. 21-25. It is worthy to mention here the *villa rustica* in Flambruzzo, Loc. Il Bosco in the municipality of Rivignano for the evidence of a production of both *ollae 7* and *ollae 9* (see CIVIDINI, MAGGI, MAGRINI 2006, p. 72).

Nevertheless, a production of coarse ware within the *villae rusticae* is widely demonstrated by both the archaeological record and literary sources[30]. It is likely that part of the pots were used to fulfil the everyday needs of the *villa rustica*. The better part of the vases produced were used instead as containers to market the *surplus* of the agricultural production.

Archaeometric analysis of *Auerberg ollae* widely demonstrated the function of some of these products as containers for dried canned meat[31], hinting at the use of coarse ware as containers for secondary products of livestock breeding.

Animal farming played an essential role for the economy of the Aquileia's *ager*. The most telling proof is provided by the existence in the city, soon after the foundation of the Roman colony, of a *forum pequarium*, i.e. a specific market place for the trading of animals and products derived from their breeding. Aquileia's *forum pequarium* has not yet been identified on positive grounds[32], nevertheless its existence is testified to by an inscribed milestone, containing directions for reaching it from *Via Postumia*[33]. Strabo reminds us that Aquileia was used as an *emporium* by people from the surrounding hill settlements, who came there to trade cattle and hides[34] .

A growing number of studies are now underlining the importance of farm breeding as an essential economic activity for the city and its

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[30] MONDIN 2011, p. 141.

[31] See chapter 6.1.9, pp. 289-304. For the most comprehensive study about this function, see the already mentioned DONAT, MAGGI *et Alii* 2007.

[32] One of the most updated review of the location of the Aquileia's *forum pequarium* is in TIUSSI 2007, pp. 258-273, where the author, widely quoting previous literature, examines different proposals for the location of the *forum*, that has been identified with archaeological remains located in different spots within or beyond the city walls.

[33] CIL I², 2197 (e p. 1093) = CIL V, 8313 = ILLRP 487a = SI 125 = Dessau 5366 = *Imagines* 208 = *Insc.Aq.* 53.

[34] STRABO *V*, 1,8:"Ἀκυληία δ᾽, ἥπερ μάλιστα τῷ μυχῷ πλησιάζει, κτίσμα μέν ἐστι Ῥωμαίων ἐπιτειχισθὲν τοῖς ὑπερκειμένοις βαρβάροις, ἀναπλεῖται δὲ ὁλκάσι κατὰ τὸν Νατίσωνα ποταμὸν ἐπὶ πλείστους ἑξήκοντα σταδίους. ἀνεῖται δ᾽ ἐμπόριον τοῖς τε Ἑνετοῖς καὶ τοῖς περὶ τὸν Ἴστρον τῶν Ἰλλυριῶν ἔθνεσι: κομίζουσι δ᾽ οὗτοι μὲν τὰ ἐκ θαλάττης, καὶ οἶνον ἐπὶ ξυλίνων πίθων ἁρμαμάξαις ἀναθέντες καὶ ἔλαιον, ἐκεῖνοι δ᾽ ἀνδράποδα καὶ βοσκήματα καὶ δέρματα."

surroundings[35]. Transhumance also played an essential role in creating a complex relationships between the flatlands and hill settlements, that turned out to be strictly intertwined thanks to the routes followed by cattle and shepherds[36].

Animal breeding produces several foodstuffs, such as a variety of cheeses, fat, animal wax and canned meat, that are suitable to be preserved in ceramic containers and that could have also been traded over medium and long distances.

Also in this case, with the partial exception of *Auerberg ollae*, there is no certain evidence of the containers used for these products. Nevertheless, coarse ware production does not need large and invasive facilities; the variety of local productions identified through archaeometric analysis testified that coarse ware vases could have been made in several little workshops, not necessarily located in major settlements. The possibility that coarse ware containers were used to trade cheese, fat, or other preserved food resulting from farm breeding should be therefore taken into consideration.

Unfortunately, for *Stella 1* coarse ware the question of content has not been definitively solved. The underwater post-depositional environment hinders the possibility of performing chemical and/or gas-chromatographic analysis in order to identify the nature of the organic traces still visible on the inner side of some pots.

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[35] A telling and up-to-date summary about the topic could be found in BONETTO 2007, that contains several bibliographic references to a variety of previous studies.

[36] The relationship between major settlements located in the flatland and minor settlements on the hill slopes or at the foot of the Alps were well investigated by Sara Santoro Bianchi and her team starting from the example of Castelraimondo (See *Castelraimondo I* and *Castelraimondo II*). Their works demonstrated a complex relationship between these different areas of the Aquileia's territory, proving that hill settlements, far from be peripheral areas, were essential productive places, whose goods were not produced only for self-sustainment. Lots of products were indeed *surplus* and were specifically made for export towards the major flatland settlements. These studies returned a complex picture of the Roman economy, characterised by an always present dualism: product for self-sustainment and goods especially made for trade always co-existed, even in only apparently minor centres.

An overview of these complex *phenomena* and relationship, that also widely mentioned previous studies, is contained in SANTORO BIANCHI 2007.

Compositional analysis were executed in the past years on one of the *ollae 2* unearthed during 2011 excavations. Results were nevertheless extremely generic: the analysis simply identified the presence of a fat substance, without being able to further define its origin[37], testifying rather to the uselessness of chemical analysis on this kind of materials, deeply altered by the riverine environment.
Detailed gas-chromatografic and chemical analysis on comparable materials were impossible to complete within the framework of this study, due to the financial impact, the time needed for this kind of research and the source of error created by the conservation environment.
Furthermore, coarse ware containers were multi-functional objects. There is no proof that the content, even when ascertained by the most recent analytic techniques, was the original one, and not the results of a secondary use of the vase. Finally, results obtained from materials unearthed in a specific context are not easily and automatically transferable to samples collected in different sites. Furthermore, the identification of the content was not a priority at the beginning of the study, therefore no definitive achievement in this field has been reached.
However, despite the impossibility to determine the vessels' content, the complete study of *Stella 1* coarse ware not only demonstrated that coarse ware was traded within the Aquileia's *ager* and beyond, exploiting the Roman network of terrestrial roads and inland waters, but it was effective in a number of respects.
Firstly, *Stella 1* coarse ware further testifies to the homogeneity of the site. It also gives insights into the nature of the materials belonging to the area of scattered artefacts, that should be considered to be strictly related to the hull remains. Most of the artefacts should be therefore approached as traded goods.
The possibility of dating the majority of the materials, that turned out to be almost all contemporary, enabled us, in the end, to assess the

[37] I would like to thank professor M. Capulli who preliminarily shared this information with me. Analysis was performed on a very restricted number of *Stella 1* materials (one fragment of coarse ware *olla 2* and some amphorae sherds) in the scientific laboratories of the University of Udine – Dipartimento di Scienze Ambientali.

chronology of the site, that should be dated between the second half of the 1st century AD and the end of the following century.
Broadening our sights, *Stella 1* coarse ware has enabled us to shed light on certain aspects of the economic dynamics in the Aquileia's *ager*, providing proof of the possibility of using coarse ware for refined economic analysis.
Stella 1 ollae bear clear evidence that they were traded as food containers. Therefore, they provide insights also into the trade of perishable goods, that otherwise remained unrecorded as archaeological materials.
The impossibility to perform gas-chromatographic and chemical analysis prevent us from positively determining the contents. However, a review of ancient literary sources, flanked by an analysis of other archaeological evidence, have enabled us to identify certain foodstuffs surely produced in this territory and that could have been traded in coarse ware containers.
Ascertained that coarse ware was traded, and that this trade involved the contents, rather than the containers, it remains to define the nature and the range/ranges of this trade.
Results of the comparative study which enabled us to retrieve important information on this topic, will be fully illustrated in the next paragraph.

7.3 Coarse ware production and distribution. Mosaic *tesserae* in the context of a complex economy

The comparative study on *Stella 1* coarse ware was successful to confirm the chronology of the types identified. A central aspect of the work was the control of possible "*variations in the proportions of a particular type of ceramic at different sites around the production centre can give valuable information about possible means of marketing and transport*"[38].

[38] ORTON, TYERS 1990, p. 82.

In plotting the distribution maps for *Stella 1 ollae* that were used as transport containers[39], it is clear that coarse ware was involved at different levels of the economic system, going beyond the traditional idea that these materials were locally produced and circulated only in a narrow area surrounding productive places.

Ollae 7 and *ollae 9* testify to a trade that could be broadly defined as *local*.

As already mentioned in the previous chapter, for both of the types a local production within the *Stella/Anaxum* basin has been proposed on the basis of archaeological evidence[40]. The *villa rustica* identified in Flabruzzo, Loc. Il Bosco, in the municipality of Rivignano, hosted a pottery workshop and at least three pottery kilns. The production, active between the first half of the 1st century BC and the end of the 1st century AD, was mainly centred on brick and tiles, but *ollae 7* and *ollae 9* are likely to have been fired in these kilns.

This workshop is interesting for different reasons. It testifies to the production, within the *Stella/Anaxum* basin and not far away from the river, of both building materials and coarse ware, that constitute the majority of finds at the *Stella 1* site. No clear evidence has been collected so far, and archaeometric analysis is needed. Nevertheless, it is likely that at least some of the products recovered at the *Stella 1* site were produced and fired in this *villa rustica* or in similar facilities identified in the surroundings. Besides, the site testifies that *villae rusticae* located in this territory could produce their own pottery without relying on imports[41], therefore making the relationship between coarse ware and agricultural products presented above highly probable.

Without proper archaeometric analysis, there is no unequivocal proof that *ollae 7* and *ollae 9* were produced within the Flambruzzo, Loc. Il Bosco *villa rustica*. They should, nevertheless, be considered as local

[39] See *Appendix II. Distribution maps*, pp. xlv-liii.

[40] See chapter 6.1.7, pp. 254-263 for *ollae 7* and chapter 6.1.9, pp. 289-304 for *ollae 9*.

[41] As otherwise already suggested by the abundance of high quality clay deposit, water and energy, in form of timber, along the river banks. See CAPULLI 2013, p. 21.

products that testify to trade, along the *Stella*/*Anaxum* river, of goods produced and manufactured within the river basin.
Stella 1 materials yielded only a restricted number of *ollae 7* and *ollae 9*, in all probability for chronological reasons. Both *ollae 7* and *ollae 9* are shapes already popular in late Celtic times and were at the end of their evolution in the second half of the 1st century AD, i.e. when the *Stella 1* barge is likely to have wrecked.
Although both regional products were characterised by short-range circulation, *ollae 7* and *ollae 9* reached slightly different areas.
As can clearly be seen from the distribution map, *ollae 7* are never attested has having been found outside *Regio X* borders, and the majority of samples were found in the low Friuli plain within the confines of the *Tagliamento* and *Isonzo* rivers, i.e. in the Aquileia's *ager*. Meaningfully, their distribution follows the routes of some major Roman roads; samples are attested as being found along *Via Postumia*, in its high variant (*Postumia Alta*), and especially along the road that used to connect Aquileia to Trieste - *Tergeste*, and that was then extended in order to reach the newly founded settlements in *Histria*. Fewer *ollae 7* were detected along *Via Julia Augusta*, heading North, a distribution that also explains the presence of these pots in some settlements of *Carnia*. However, these containers spread only South of the Alps.
Ollae 9 are characterised instead by wider circulation: they are common in *Regio X, Raetia, Noricum* and *Pannonia*, reaching territories located both North and South of the Alps, likely because of the Alpine origin of the type[42].

A *medium-distance* trade is the one testified to by *ollae 2*.
They are attested in a slightly broader territory, comprehending the entire *Regio X* and some areas beyond its Eastern border. Samples are

[42] Furthermore, it is worthwhile to remember that *ollae 9*/*ollae Auerberg* are a complex productions and that a long history of archaeometric studies definitively proved the existence of several local productions that maintained the shape unchanged using different local raw materials. It is also likely that *Auerberg* pots produced in different place had different functions. For a detailed dissertation on this *ollae*, see chapter 6.1.9, pp. 289-304 and mentioned bibliography.

distributed along the commercial routes that used to connect Aquileia and its *ager* with the territories located beyond the Julian Alps.
Strabo recalls a very well-known, and possibly very ancient path that was used to transfer merchandise from Aquileia to the settlement of *Nauportus*, and from there to the river *Ister*, the ancient name of the Danube, crossing the Alpine pass of Okra-*Ocra*[43]. The opening of *via Gemina* at the end of the 1st century BC, directly linking Aquileia with the new colony of Ljubljana - *Emona*, would have strengthened and hastened these pre-existing commercial links.
Another preferential route followed by *ollae 2* is once again the road leading towards *Histria*.
Looking at the distribution of stamped bricks recovered on the *Stella 1* site, it is interesting to note that at least some of them, namely *C. Titi Hemerotis, M. Albius Rufus*, *L. Epidius Theodorus*, *Epidiorum C. M.* and *Valeriae Magnae Epidiani*, show a similar distribution. They are local products of the *Stella/Anaxum* basin[44], widely spread in the territory East of Italy, following both the road leading to *Emona* and the one heading South, towards *Histria*.
1st century AD was a period of expansion of the Romans in the North-Eastern Adriatic when several colonies in *Histria* and *Dalmatia* were founded. At least at the beginning, these new foundations, still lacking their own local workshops, were supplied with building materials produced in the lower Friuli plain and above all within the *Stella/Anaxum* basin, one of the most important productive districts[45].
It is easy to image that during the 1st century AD cargos with a composition very similar to that of *Stella 1* were loaded with building materials and typical food preserved in coarse ware pots with destination to these territories located East of the Alps, to *Dalmatia* and *Pannonia*, following the progressive diffusion of the Roman expansion.

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[43] STRABO, *IV*, 6, 10:"ἡ δ᾽ Ὄκρα τὸ ταπεινότατον μέρος τῶν Ἀλπεών ἐστικαθ᾽ ὃ συνάπτουσι τοῖς Κάρνοις, καὶ δι᾽ οὗ τὰ ἐκ τῆς Ἀκυληίας φορτίακομίζουσιν ἁρμαμάξαις εἰς τὸν καλούμενον Ναύπορτον, σταδίων ὁδὸν οὐ πολὺπλειόνων ἢ τετρακοσίων:"
[44] For the results of the preliminary study lead by Professor S. Magnani on bricks and tiles, see chapter 3.1, pp. 37-43.
[45] PRENC 1996, p. 243.

The existence of medium-distance trade involving simple and every-day products such as coarse ware pots, or, better, the foodstuffs contained inside them, testifies to the wealth and dynamicity of the Roman economic system already in early Imperial times. The capillarity of the routes network enabled Romans to easily bring with them, during their conquest, their costume and habits, that were soon adopted (and adapted to their demands) by local populations.
The archaeological record shows the adoption of new cooking pots and/or new objects related to food preparation and consumption, indicating an in-depth integration between two cultures[46]. Finding, in the Eastern territories, a wide presence of *ollae 2* that suggests the importation of foodstuff produced within *Regio X* borders is a sound indication that already in early Imperial times populations beyond the Julian Alps were in the process of adopting the Roman culture and way of life.

A number of other materials collected in the area of scattered artefacts shows a wider distribution, testifying therefore that the *Stella/Anaxum* basin was also inserted in long distance commercial trade.
Ollae 1 and *olle 8* are indeed spread throughout a wide area, comprehending the entire Northern Italy. The Appennines constitute a barrier for the diffusion of both types[47], while preferential routes can be easily spotted looking at the distribution maps.
Both *ollae 1* and *ollae 8* are mainly attested along *via Postumia* and in a number of sites located along the river Po. It has to be further stressed that *ollae 1* and *ollae 8* are frequently found associated with one another in several sites, and it is therefore likely that they were traded together, exploiting mainly the above-mentioned preferential routes.
Ollae 1 and *ollae 8* distribution, mainly attested along a consular road and a main river, indicating that the common belief of a more

[46] GALLI 2001, pp. 224-225.
[47] With a partial exception for some *ollae 8* samples, found in the territories of nowadays Lunigiana, that nevertheless could be explained with the proximity of this area with a well-known productive places, located along the seashores of nowadays Liguria and in its hinterland (see the distribution maps in *Appendix II. Distribution maps: Ollae* 8, pp. l-li, and chapter 6.1.8, particularly pp. 271-272 for the list of recognised *ollae 8* productive centres).

expensive terrestrial transport versus cheaper water transport cannot be considered valid. Archaeological evidence rather confirms the high level of integration, within the Roman trade system, of both terrestrial roads and inland waterways. On a more local level, this could also be observed in the *Stella/Anaxum* basin.
Both *ollae 1* and *ollae 8* were realised in two fabric variants, one finer and one coarser, while archaeometric analysis has demonstrated the coexistence of both imported and locally produced samples at the same site[48]. This not only complicates the evaluation of the mechanism in of production and merchandise export. It is a sign that the circulation of a shape was not limited to the object itself.
Both *ollae 1* and *ollae 8*, at some point, started to be produced without typological changes in different local workshops, located along the same preferential routes followed by imported vases. This could be due to migrating potters who brought their *repertoire* with them or to a non-verbal reading where containers are specific and reserved for a special content. The latter would signify that there were two qualities of one and the same content, the imported for the long-distance trade being the more fancy, and the locally produced probably more fresh. This is a further proof that the Roman road network was used not only to trade objects and food products, but also ideas and models.
For the purposes of the present research, *ollae 1* and *ollae 8* are of particular importance because they prove that coarse ware was traded, already in the 1st century AD, even on a supra-regional level, definitively overcoming the traditional idea that these materials were only locally made and distributed.
Furthermore, they also testify that the *Stella/Anaxum* basin was able to receive and also further distribute products coming from territories located even far away.

This turns out to be particularly evident looking at some coarse ware collected within the *Stella 1* area of scattered artefacts that testify to a trade of even longer range. The three *Pompeian Red-Ware* and the *orlo*

[48] *Ollae 8* have now a long tradition of archaeomteric analysis, while for *ollae 1*research is still at the beginning and further *data* are needed to confirm the first results. See chapter 6.1.1, pp. 143-179 for *ollae 1* and chapter 6.1.8, pp. 264-288 for *ollae 8*.

bifido pans share indeed a fabric characterised by small flakes of glistering black mica, volcanic inclusions and fine obsidian grains, that enable their recognition as imported goods from the South-Western Tyrrhenian coast[49].
For their low number they cannot be considered as part of the cargo. However their presence further testifies the economic dynamicity of the *Stella/Anaxum* basin that, even if was more open to products that circulated in Northern Italy, was also able to import goods from the Mediterranean area.
The presence of these pans is also interesting from a cultural point of view. It testifies that, besides a cultural *koiné* typical of Northern Italy, proved by a number of artefacts commonly spread in all of the territory above the river Po, Aquileia's *ager* was also inserted in another cultural *koiné* that could be broadly defined as Roman, testified to by certain products like the *Pompeian Red-Ware* pans, made in the Mediterranean basin but which soon spread all over the Roman Empire.
These two cultures existed together and they seem to support and strengthen each other, while creating something completely new. The pressure of the Romans introduced new objects, models and ideas. This led to reinforce local cultures and habits. Local populations, while accepting foreign models, also strive to preserve and reinforce their traditions, somehow seen as symbols of social identity.
Evidence of this can perhaps be seen in the high conservatism of certain decorations, even on coarse ware *ollae*, that maintain motifs which remain unchanged and which derive from Celtic traditions.

Besides these cultural consideration, the distribution of *Stella 1* coarse ware demonstrates that these products circulated at local, regional and even supra-regional level. The different shapes and decorations are a sign for the composite nature of the cargo, the same way as the different names attested on the stamped bricks.
The fifty-four stamped bricks collected from the nineteen eighties at the *Stella 1* site testify to nine local producers. Even if it was common that bricks with different stamps were produced and fired within the same pottery workshop during Roman times, *Stella 1* stamped bricks could

[49] See chapter 6.4, pp. 324-334.

be traced back to at least three different *figlinae*, all identified as being on the premises of *villae rusticae* located along the river banks (i.e. the *villa rustica* of Stroppagallo, the one in Casali Pedrina and the one in Muzzana del Turgnano. Stamps with the mark *C. Oppius Agathopus* were instead produced in the territory of Concordia - *Concordia Sagittaria*[50]).

The *Stella 1* cargo was therefore composed of materials that were not produced in the same places; it was instead a composite cargo, which did not maintain the composition with which it was assembled in the place of departure of the ship. On the contrary, it was continuously reshaped, thanks to smaller or larger commercial exchanges that happened along the river, while the ship was moving downstream along the watercourse.

Indeed, the cargo was composed of goods locally produced, directed to a variety of markets, located at variable distances. But it also comprehended imported materials, that had arrived in the *Stella*/*Anaxum* basin exploiting the integrated network of Roman routes. Once arrived at the *Stella* basin, these goods also found new preferential distribution channels, that, for example, enabled artefacts produced in North-Western Italy, like some of the *ollae 8*, to reach even the Southern coasts of *Histria.*

The hypothesis so far presented regarding the circulation of coarse ware materials still needs a definitive confirmation that could come only from the results of petrographic and chemical analysis.

Within the framework of the present research, as mentioned before, it has not been possible to perform any kind of archaeometric analysis, due to both internal and external limitations.

The effects of prolonged permanence in the water deeply altered *Stella 1* coarse ware, wearing down the surface, causing the loss of inclusions, and in some cases even the degradation of the more volatile chemical compounds. As a result, archaeometric characterisation would not necessarily have mirrored the original composition of raw materials and the results obtained could easily have been misleading.

[50] For a detailed dissertation on the *Stella 1* bricks and tiles productive centre, see chapter 3.1, pp. 37-43 and mentioned bibliography.

Comparable materials unearthed in other sites are not always easily accessible; furthermore, in order to retrieve useful *data*, a systematic sampling would have been needed. Also in this case, given the fragmentation of archaeometric studies so far performed on materials unearthed within *Regio X* borders[51], it would have been difficult to insert the results in a broader picture.
For all these reasons, and considering once again the financial impact and the time needed for archaeometric analysis, it has been postponed until future developments of the research are available.
It should be nevertheless acknowledged that mapping the distribution of coarse ware in a broad area comprehending the entire *Regio X* will turn out to be extremely useful, in the future, as a basis for a targeted sampling of artefacts to be analysed through archaeometric techniques. The study so far presented enables us to identify some shapes that circulated over long distances, suggesting therefore on what kind of materials further research should focus its attention.
Only the contribution of hard science will definitively confirm the pattern of circulation of ancient Roman coarse ware and will completely demonstrate what is already suggested by archaeological evidence, i.e. the economic dynamicity of the *Stella/Anaxum* basin.
Coarse ware indeed testifies that the territory around the river was directly involved in long distance trade that it used to connect this area of the Aquileia's *ager* virtually with entire Northern Italy. Since it was also a production area, goods manufactured here were dispatched to Aquileia and its surroundings but also to more distant markets.
Stella 1 coarse ware, analysed looking at its wide distribution, testifies to the intense and lively economic dynamism of the *Stella/Anaxum* basin, long considered to be simply one of the most important productive areas of the Aquileia's *ager* but that now reveals itself as a central place for the purchase and redistribution of a variety of products.
This area, traditionally considered peripheral and only tributary to Aquileia, played instead an autonomous and fundamental role in a variety of commercial transactions, mainly in the redistribution of locally produced food and building materials. It was perfectly inserted

[51] See chapter 4.4, pp. 106-114.

in medium-long distance trade, without requiring the mediation role of Aquileia.
The present research has therefore an unexpected outcome, which is the demonstration that a new paradigm is needed in order to describe the economic relationship between Aquileia and the surrounding *ager*.
Aquileia was definitely the main *emporium* of the North Adriatic arch and played a primary role in the redistribution of imported goods to the surrounding territories. Nevertheless, these surroundings areas, thanks to the capillarity of the Roman integrated network of terrestrial routes and inner waterways, cannot be seen merely as receivers of the products redistributed by the main city. On the contrary, some of these areas, like the *Stella/Anaxum* basin, were directly inserted in this network, and therefore they autonomously received imported products and were autonomously responsible for their distribution.
Furthermore, also the model according to which the hinterland dispatched its products only to Aquileia's market should be overcome. Distribution of *Stella 1* coarse ware suggests that local producers were able to autonomously irradiate their products on external markets, even distant ones, not only over the great consular roads, but also through the capillary network of minor routes, that often connected *villae rusticae* and other productive places with each other and further to the major roads.
In the *Stella/Anaxum* basin a leading role in these autonomous commercial transactions was played by the river, that, as suggested by the fact that trade could be performed also along its course, was not merely a pathway, but rather a market itself.

7.4 Concluding remarks

According to this new model, neither the departure point, nor the final destination of the *Stella 1* barge can be clearly defined.
The easiest solution is that the ship was heading towards Aquileia, that could have been reached through endo-lagunar navigation from the mouth of the *Stella* river in the Marano lagoon, to the Grado lagoon.

However, if the centralising role of Aquileia needs to be discussed, it is also likely that, once the Marano lagoon was reached, the ship would have been able to continue its navigation, following lagoon routes, heading indifferently towards the Eastern Adriatic arch, or to the Western coast, in the end connected with the river Po. This is also a further proof that *Stella/Anaxum* products, both the imported and the locally produced ones, could have been distributed in all the places where they are attested also without arriving at Aquileia.

The Roman economy should be approached as a mosaic of local economies, that work together within the same framework. In North Eastern Italy, in these border territories at the foot of the Alps, a central role was also played by settlements apparently minor, but actually essential for both the production and circulation of goods. Furthermore, they were protagonist not only in local and regional trade, but also in commercial transactions with very distant territories[52].

Starting with *Stella 1* coarse ware and progressively broadening our sights to analogies and comparable materials unearthed in the whole of Northern Italy, the present research delineates an extremely lively and complex picture of commercial circulation and distribution through the presence of pots formerly considered of no economic interest.

The coexistence within the same site of a variety of coarse ware pots, both imported and locally produced, provided one more sign to overcome the traditional idea of their local importance only.

Furthermore, the size and dimensional relationship among vases, as well as their modularity, prove that coarse ware vases were not simply home-used everyday pots, but could easily be adapted as transport containers.

Indeed, telling evidence supports the idea that coarse ware was traded not only for its value and quality for kitchen use, but quite often for its content.

Lacking large sampling series, ancient literary sources, supported by variety of archaeological and historical evidence, are essential to make hypothesis of the nature of the contents. They suggest to propose

[52] For some insights into these directions, even though they mainly focus on the role of Alpine settlements, see in particular SANTORO 2017, p. 285 and mentioned bibliography.

perishable goods, most likely cured and preserved foodstuffs. Whether this was of animal or vegetable origins, it remains to be detected. It is unknown whether the content was liquid, solid or some mixture of both.

Despite coarse ware's being only a by-product of the trade, and the traded goods represented by the contents, it was however inserted into a complex commercial system, and circulated on different levels, reaching local, regional and even supra-regional markets.

Beyond these results, the composite cargo of *Stella 1* vases, that included both imported and locally produced goods, testifies that the *Stella*/*Anaxum* basin had an autonomous commercial life.

This only apparently peripheral area was first of all a productive centre, able to dispatch its products not only to Aquileia but to a variety of markets. It was also a redistribution centres for goods imported thanks to a commercial networks that involved entire Northern Italy and even the territories located immediately beyond Italian borders.

It is therefore necessary to delineate a new economic paradigm, that reveals the complexity of the relationship between Aquileia and its *ager* and that forces us to overcome the traditional model that centralizes all the commercial transactions in Aquileia and that assigns the role of distribution node for imported goods only to the colony.

The complete study of *Stella 1* coarse ware, tackled not only by looking at the complexity of the archaeological record, but also at ancient literary sources and at the complex network of Roman roads and inland waterways, confirms the possibility of using coarse ware for a refined economic analysis.

Far from being a mere dating tool, coarse ware, if approached through multidisciplinary lenses, also enables us to shed light on the trade of perishable goods, otherwise not preserved in the archaeological record. Besides, it enlightens the economic dynamicity of an area only apparently peripheral, contributing to better define its complex relationship with the main city of *Regio X,* Aquileia.

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Abbreviations

AAAd
Antichità Alto Adriatiche

AqNostra
Aquileia Nostra

ArchMed
Archeologia Medievale

LRCW 3
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NotALomb
Notiziario della Soprintendenza Archeologica della Lombardia

NSA
Notizie degli Scavi di Antichità

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Appendix I.
Tables of comparisons

Ollae 1				
N.	Place	Settlement/Necropolis/ Public Building/…	Chronology	Bibliography
Regio X – Venetia et Histria				
-*Ager* of Aquileia				
1	**Aquileia**			
	Unknown	Unknown (materials from Toppo collection)	1st AD	CHINELLI 1995, pp. 98-101, fig. 35-36, inv. 1004-1005-1006
	Unknown	Unknown (materials from old collections)	Not specified	STRAZZULLA RUSCONI 1979, c. 118, nota 146 (inv. 3699 + s.n.i.)
	Fondo Fogar	Unknown	1st AD	STRAZZULLA RUSCONI 1979, c. 118, nota 146, inv. 53719 CHINELLI 1995, p. 98
	Area East of the *Forum*	Settlement	1st AD - 4th AD	RUPEL 1994, p. 214, Tav. 29, Ccg 37, inv. 289629a-b, inv. 289513 BUORA *et Alii* 1994, p. 75, Tav. XIII, Ccg 2, inv. 298. 568
	Via San Girolamo	Necropolis	1st - 2nd AD	GIOVANNINI, MANDRUZZATO, MASELLI SCOTTI, MEZZI, VENTURA 1997, cc. 103-104, Tav. 7
	Loc. Colombara	Necropolis	1st - 2nd AD	GIOVANNINI, MANDRUZZATO, MASELLI SCOTTI, MEZZI, VENTURA 1997 T.9, cc. 129-130, Tav. 14 T. 15, cc. 143-144, Tav. 17 T. 20, cc. 149-150, Tav. 20 T. 24, cc. 157-158, Tav. 24
	Loc. Beligna	Necropolis	1st AD	GIOVANNINI,MANDRUZZATO, MEZZI, PASINI, VENTURA 1998

				T. 27, cc. 253-254, Tav.8 T. 39, cc. 275-276, Tav.13 T. 54, cc. 291-292, Tav.17 T. 57, cc. 295-296, Tav.19
	Canale Anfora	Infrastructure	1st - 2nd AD	CIVIDINI 2017, p. 241-243, fig. 12
	Insula Forum/Fluvial Harbour	Settlement	1st - 4th AD	BOTTOS 2018, p. 376, Tav. I,4
	Via Bolivia	Settlement	From a contaminated context	CEAZZI, DEL BRUSCO 2014, p. 944, Tav. 6,14
2	**Castions di Strada, Loc. Paradiso/Rem del Sterp**	*Villa rustica* (+ ? Pottery kiln)	From the 1st BC	CIVIDINI 2002, p. 188, Tav. 74, CCg 1 pp. 189-190, pic. 89-90, Ccg 3-4 p. 190, Tav. 76, Ccg 6 CASSANI TERMINI 1991, pp. 17-18
3	**Joannis**	*Villa rustica*	1st AD	STRAZZULLA RUSCONI 1979, cc. 69-70, Tav. VIII, 4
4	**Medea**	*Villa rustica*	Second half 1st AD	FURLANI 1971, cc. 7-8, fig. 8,6-7
5	**Neblo Borg**	Pottery and brick workshop	1st - 2nd AD	VIDRIH-PERKO, ŽUPANČIĆ 2011, p. 158, fig. 12, 1-2
6	**Pozzuolo del Friuli**	Necropolis	1st AD	ADAM *et Alii* 1983-1984, p. 209, Tav. 32, fig. 35,8
7	**Rivignano**			
	Flambruzzo, Loc. Molino Santin/Pralunghi	Roman farm	End 1st BC - 2nd AD	MAGGI 2001, p. 44, Tav. 3, Ccg 4
	Sivigliano, Loc. Braidis	*Villa rustica*	1st - 2nd AD (?)	MAGGI 2001, p. 150, Tav. 32, Ccg 24
8	**Sedegliano, Loc.**	*Villa rustica*	End 1st BC - 2nd AD	CIVIDINI 1997, p. 57, Tav. 5e, Ccg 20,

	Turrida			p. 59, Tav. 5g, Ccg 27-28, p. 61, Tav. 5h, Ccg 37
9	**Sevegliano**	Ploughsoil materials	1st BC	BUORA 1985b, c. 83, Tav. III, 20, inv. 221.967
- *Ager* of Trieste				
10	**Duino Aurisina**	Settlement	1st AD	MASELLI SCOTTI 1983, p. 54, Tav. 4, 3-5
11	**Locavaz**	Pottery workshop	1st AD	VENTURA, DEGRASSI 2016, p. 309, Tav. 1, fig. 6, f. 5
12	**Moschenizze**	Pottery workshop (?) or related structures	Second half 1st BC - beginning 2nd AD	VENTURA, DEGRASSI 2016, p. 310, Tav. 3.1-2
13	**Ronchi dei Legionari**	*Villa rustica*	1st - 2nd AD	MANDRUZZATO 2008, pp. 96-98, Tav. XIII, figg. 1-4
14	**Sermin**	Settlement	1st BC - First half 1st AD	HORVAT 1997, Tav. 25,13 and Tav. 56,5
15	**Socerb/San Servolo**	Necropolis	Middle 1st BC - Middle 1st AD	CASARI 2002, p. 108, fig. 48
16	**Timavo (river's mouth)**	*Villae rusticae* + under water excavation	1st BC - 1st AD	AURIEMMA *et Alii* 2008, p. 169, Tav. VIII, 114-115
17	**Trieste, Loc. Crosada**	Settlement	End 1st BC - 4th AD	*Trieste Antica,* p. 109, type 7-8-9, Tav. 25, fig. 13-17
- *Ager* of Concordia				
18	**Chions, Loc. Gheno**	Ploughsoil materials	Beginning 1st AD	VENTURA, DONAT 2003, c. 411
19	**Concordia**	Well (urban settlement)	End 1st BC - 1st AD	VIGONI 2009a, p. 145, fig. 24,1, p. 147, fig. 26, 1-3
20	**Morsano al Tagliamento**	*Villa rustica*	Beginning 1st AD	VENTURA, DONAT 2003, c. 411
21	**San Vito al Tagliamento, Loc. Gorgaz**	*Villa rustica*	1st AD	VENTURA, DONAT 2003, c. 411, fig. 4, 16 BUORA 1985, p. 81
22	**Torre di Pordenone**	*Villa rustica*	1st - 2nd AD	*Villa romana 1999*, p. 149, fig. p. 126, CA 1-2
23	**Villa di Villa**	Votive deposit	1st AD	MAIOLI 1987, pp. 81-82, Tav. 4,3 e 4,7

- Regio X – Venetia et Histria				
24	**Adria**	Urban waste dump	End 1st BC - Beginning 1st AD	CORTI, TARPINI 2012, p. 141, nota 64 DE MIN, BONOMI *et Alii* 1986, p.220, Tav.6, 65
25	**Adro**	Pottery kiln	1st - 2nd AD	BREDA 1993, p. 20, tav. V, nn. 6-7
26	**Brescia**	Necropolis	Second half 1st BC - 1st AD	BEZZI MARTINI 1987, p. 54, fig. 8 t. 52, 11-12, p. 72, p. 80, p. 117, fig. 35.
27	**Calvatone - *Bedriacum***	Settlement	1st - 2nd AD	PORTA 1991, pp. 168-169, Tav. II, 1-2 DELLA PORTA, SFREDDA 1996, p. 180, fig. 214
28	**Cavriana**	Incineration grave	First half 1st AD	FORTUNATI ZUCCALA 1986, p. 206, n. 1, Tav. II, 1
29	**Chiunsano**	Rural Settlement	1st - 2nd AD	CORTI 2016, pp. 100-102, figg. 4,58-63
30	**Cremona**	Unknown	Second half 1st BC - 1st AD	PONTIROLI 1974, p. 108, n. 102 (547), Tav. LIX
31	**Ljubljana - *Emona***	Necropolis	1st - 2nd AD	PETRU 1972, T. 231, Tav. XXIII, n. 6 T. 480, Tav. XXXI, nn. 8-9 T. 550, Tav. XXXVI, n. 35 T. 753, Tav. XLVIII, n. 23 T. 754, Tav. XLVIII, n. 25 PLEŠNICAR-GEC 1972, T. 107, Tav. XXVIII, n. 1 T. 112, Tav. XXX, n. 5 T. 131, Tav. XXXV, n. 2 T. 135, Tav. XXXVII, n. T. 165, Tav. XLVI, n. 6 T. 275, Tav. LXXV, n. 8

				T. 386, Tav. CIV, n. 11 T. 539, Tav. CXXIV, n. 2 T. 615, Tav. CXLI, n. 12 T. 652, Tav. CL, n. 6 T. 659, Tav. CLIII, n. T. 759, Tav. CLXII, n. 2 PLEŠNICAR-GEC 1977, p. 80, Tav. 4, 4-6
32	**Loron**	*Villa rustica*	1st - 2nd AD	DUBOÉ 2001, p. 214, fig. 37, p. 215, fig. 41
33	**Manerbio**	Necropolis	1st - 2nd AD	PORTULANO, RAGAZZI 2010, pp. 88-89, Tav. II, 6-10 Tav. III. 1-8 t. 2, p. 31, fig. 2 t. 5, pp. 32-35, figg. 24-25 t. 9, pp. 35-37, fig. 16 + fig. 26 t. 44, p. 58, fig. 3
34	**Meolo**	Settlement	1st - 2nd AD	PETTENÒ, D'ISEP 2005, pp. 176-178, figg. 2.3, 2.5 e 2.8
35	**Musile di Piave**	Settlement	End 1st BC - Beginning 1st AD	CROCE DA VILLA, FAVERO *et Alii* 1990, pp. 180-191, fig. 9,5
36	**Nave (BS)**	Necropolis	1st AD	*Sub Ascia* 1987, Tav. 31,3-5, Tav. 32,1-4
37	**Noventa di Piave**	Settlement	Beginning 2nd AD	ASTA, CIVIDINI *et Alii* 2011, p. 21, fig. 10,5
38	**Padova**			
	in via Ognissanti / vicolo Pastori	Cremation grave	Beginning 1st AD	ROSSI 2011, p. 127, Tav. 4, type 9.1
	via G. Tiepolo / via S. Massimo	Necropolis	Second half 1st AD	ROSSI 2011, p. 133, Tav. 4, type 9.2
	via Acquette	Settlement	1st AD	CIPRIANO 2007, p. 129, figg. 6,23-25
	Amphitheatre	Settlement	Second half 1st AD	MAZZOCCHIN *et Alii* 2006, p. 38, fig. 14,1

39	**Pula**	Necropolis	Second half 1st BC - 2nd AD	MATIJAŠIĆ 1991, Tav. 1, t. 2, fig. 1 Tav. 1, t. 4, fig. 1 Tav. 2, t. 3, fig. 1 Tav. 7, t. 12, fig. 1 Tav. 8, t. 13, fig. 1 Tav. 8, t. 15, fig. 1 Tav. 9, t. 19, fig. 1 Tav. 13, t. 29, fig. 1 Tav. 19, t. 53, fig. 1 Tav. 29, t. 73, fig. 5
40	**Ro Ferrarese**	Rural settlement	1st - 2nd AD	CORTI 2018, p. 208, figg. 2, 5-6
41	**Roncade, Loc. Ca' Tron**	Rural settlement	1st - 2nd AD	BUSANA, CERATO *et Alii* 2008, p. 49, fig. 8,4 BUSANA, CERATO, ROSSI 2010, p. 63, fig. 6,3
42	**Rovinj, Veštar bay**	Settlements	Second half 1st - beginning 2nd AD	PEŠIĆ 2014, p. 74, fig. 7, 10, 21
43	**Salò, Loc. Lugone**	Necropolis	Second half 1st AD	MASSA 1997, p. 114, Tav. XXXV, 11/ XXXVIII, 4. T. 73, scheda n. 1
44	**Sambruson di Dolo**	Settlement	Second half 1st AD	ZAMPIERI 2009, pp. 160-161, Tav. LXVI, 27-28
45	**Simonov zaliv**	*Villa rustica*	End 1st AD	GROH, SEDLMAYER 2017, p. 152, Tav. 10,6-7
46	**Spodnje Škofije**	*Villa rustica* +pottery workshop	1st - 3rd AD	ŽERJAL 2011, p. 143, Tav. 4, 5-6.
47	**Vicenza**	Settlement	1st AD	MAZZOCCHIN 2011, p. 300, fig. 10, 4-5
48	**Vipava, Laurinova ulica**	Necropolis	1st - 2nd AD	TRATNIK 2014, Tav. 4, 25 Tav. 8, 56-57
Regio XI - Transpadana				
49	**Angera**			
	via Cadorna	Settlement	3rd - 4th AD	*Angera Romana II*, pp. 414-415, p. 553,

				Tav. 104, Tav. 120, fig. 4-5
	Necropolis	Necropolis	Second half 2nd - 3rd AD	LAVIZZARI PEDRAZZINI 1980, pp. 224-226, Tav. 15,2 *Angera Romana II*, p. 620
	ex Caserma Carabinieri	Building	Not specified	*NotALomb* 1985, figg. 88, 10-12
50	**Arsago Seprio**	Necropolis	End 1st AD - end 2nd AD	FERRARESI, RONCHI, TASSINARI 1987, pp. 32-34
51	**Bergamo**	Settlement	1st - 2nd AD	*NotALomb* 1985, p. 108, fig. 98, 8
52	**Biella**	Necropolis	1st - 2nd AD	PREACCO ANCONA 2000, pp. 112-119, fig. 112, A1, fig. 114, fig. 116 *Biella*, pp. 114, fig. 25, 13, n. 208 e nn. 343-344 Tav. 2, fig. 2-1, Tav. 3, 8D, Tav. 4, 10A-2 Tav. 6, fig. 15-1 e fig. 16-1 Tav. 8, 23.1, 24.1, 25.1 Tav. 9, 26.1, 27.1, 29.1 Tav. 13, 37.1 3 40.2 Tav. 14, 42.1 e 43.1 Tav. 17, 48A.1, 48B.1 Tav. 21, 62.1, 63.1, 63.3 Tav. 22, 68.1, 67.1 Tav. 23, 73B.1 Tav. 24, 74.1, 77.1, 79.1, 80.1 Tav. 25, 81,82,83 Tav. 26, 87 Tav. 27, 96, 94, 99

				Tav. 28, 101, 102, 103 Tav. 29, 107 Tav. 30, 110. 113, 114 Tav. 31, 119,120 Tav. 33,127, 129 Tav. 36, 144.1 Tav. 37, 151, 155, 156.1 Tav. 38, 161, 162 Tav. 40, 167, 168, 169 Tav. 41, 179 (seconda metà I/II d.C., 23 cm) Tav, 42, 181, 182, 185, 186 Tav. 43, 188.1, 189, 190 Tav. 47, 212.2, 216 Tav. 48, 218, 219, 225.1, 225.2 Tav. 49, 227, 23, 231 A.1, 231 B.1 Tav. 50, 233, 236.1 Tav. 51, 238 , 242.1 Tav. 52, 243.1 Tav. 54, 261, 262.1, 253 Tav. 56, 266, 269 Tav. 59, 288 Tav. 64, 296.1, 297.1 Tav. 65, 304, 305.1 Tav. 66, 316 A, 317.1, 319, 321 Tav. 68, 331 Tav. 70, 342.1, 343.1 Tav. 71, 348 Tav. 74, 364.1 Tav. 76, 392, 393.1

				Tav. 77, 399.1, 407.1 Tav. 78, 409.1 Tav. 79, 430 Tav. 80, 437 Tav. 82, 461 Tav. 84, 475.1 Tav. 85, 482.1 Tav. 86, 494
53	**Carpignano Sesia**	Rural Settlement	Second half 1st AD - beginning 2nd AD	SPAGNOLO 1982, p. 95, Tav. XLVI, 8 Tav. XLVII, 10
54	**Caselette**	*Villa rustica*	End 1st BC - 1st AD	WATAGHIN CANTINO, LANZA, CROSETTO 1980, pp. 124-125, Tav. XLV, 15 REBAUDO GRECO 1980, p. 138 Tav. XLVII (type 7)
55	**Cerrione**	Necropolis	1st - 2nd AD	BRECCIAROLI TABORELLI, DEODATO 2011, p. 163, fig. 132 (types B1,2 and B1,3)
56	**Corbetta**	Necropolis?	Second half 1st BC - 2nd AD	DE DONNO *et Alii* 1995, p. 124, Tav. 8, 42-45
57	**Cozzo Lomellina**	Settlement	End 1st BC - 1st AD	INVERNIZZI *et Alii* 1997, p. 58, Tav. 5,39 p. 62, Tav. 6,47
58	**Gambolò**	Necropolis	End 1st BC - beginning 1st AD	VANNACCI LUNAZZI 1983, p. 227, t. 24 via XXV Aprile, Tav. XIV, 11-12 pp. 232-233, t. 2 via Pascoli, Tav. XVII, 5 pp. 242-244, t. 10 via Pascoli, Tav. XXI, 5
59	**Garlasco**	Necropolis	End 1st BC - 1st AD	VANNACCI LUNAZZI 1982, p. 114, t. 19, Tav. VIII, 1
60	**Greggio**	Settlement	Beginning 1st BC - 2nd AD	SOMMO 1994, p. 104, Tav.2, 13, 18, 20,22 Tav. 3, 24, 26, 28,29,33

61	**Ivrea**			
	Hotel "La Serra"	Settlement	End 1st[t] BC - 1st AD	BRECCIAROLI TABORELLI 1989, p. 226, Tav. XCII, 8
	Oriental *suburbium*	*Villa rustica*	End 1st BC - half 1st AD	BRECCIAROLLI TABORELLI 1998, pp. 83-85, Tav. XXX, 138, Tav. XXXI, 139-140, Tav. XXXII, 166-169
62	**Legnano**	Necropolis	End 1st AD - beggining 2nd AD	*Riti e offerte*, p. 14, t. 18, p. 16, fig. 5
63	**Locarno, Loc. Solduno**	Necropolis	End 1st AD - beginning 3rd AD	DONATI 1979, p. 120, t. 57.4, fig. 169, p. 124, 57.7, fig. 184, p. 126, t. 57.9, fig. 190, p. 146, t. 58.16, fig. 202, p. 196, t. 1956/S2
64	**Lurate Caccivio**	Necropolis	Second half 1st AD - 2nd AD	BUTTI RONCHETTI 1985, p. 17, t. 3, n. 15, Tav. V, n.15, p. 24, t.6, n. 10, Tav. VII, n. 10, pp. 54-55, sporadic, n. 16, Tav. XV, n. 16
65	**Mariano Comense**	Settlement	Middle 1st - 2nd AD	BUTTI RONCHETTI 1987, p. 73, Tav. VI, 17 p. 78, Tav. VIII, 58 SAPELLI 1980, p. 93, t. 17, Tav. 2, 4c
66	**Milano**			
	City center	Various urban settlements	1st - 2nd AD	*Scavi MM3*, pp. 186-188, Tav. LXXXVI, 4-18 (types 59-64)
	Santa Caterina	Necropolis	Second half 1st AD	BOLLA 1988, p. 81, t. II, Tav. XLII, 23/29
	Via della Commedia	Necropolis	Middle 1st - middle 2nd AD	BOLLA 1988, p. 104, t. 4, Tav. LXI, 25/6 p. 104, t.5, Tav. LXII, 25/9

	Cortile università Cattolica	Settlement	1st AD	CORTESE 2003, p. 67, figg. 4,5-8
67	**Oleggio**	Necropolis	End 1st BC - beginning 2nd AD	POLETTI ECCLESIA 1999, p. 312, fig. 350/A,2 *Conubia Gentium* p. 61, t. 3, fig. 26, 5, pp. 72-73, t. 13, fig. 46,6 pp. 84-86, t. 27, figg. 63,1; 63, 4 p. 103, t. 42, fig. 82,2 p. 108, t.47, fig. 87 p. 130, t. 65, fig. 112,3 p. 151, t. 90, fig. 139,3 p. 166, t. 109, fig. 161.2 pp. 170-172, t. 114, fig. 167,7 p. 176, t. 125, fig. 173,1 p. 182, t. 132, fig. 180.1 p. 183, t. 133, fig. 181.1 pp. 195-196, t. 151/152, fig. 199.1 pp. 198-199, t. 159, figg. 203.1-2 p. 207, t. 167, figg. 214.12-13 p. 208, t. 168, figg. 216, 5-6-11 pp. 210-211, t. 169, fig. 218,5 pp. 225-226, t. 197, fig. 238 pp. 227-228, t. 199, figg. 241.5-7-8 p. 229, t. 200, fig. 243 pp. 236-237, t. 210, fig. 255.7 p. 242, t. 214, fig. 260.6 pp. 245-246, t. 218, fig. 267.2 p. 252, t. 231, fig. 278 p. 259, t. 234, fig. 283.1

				p. 263, t. 243, fig. 296.1 pp. 281-283, t. 263, fig. 323.7
68	**Parabiago**	Necropolis	Second half 1st AD	*Antichi silenzi*, pp. 112-113, t. 29, Tav. 39,3
69	**Rovello Porro**	Necropolis	1st AD	GIORGI, MARTINELLI, RONCHETTI 2009-2010, pp. 229-230, Tav. V, 3-5 (T. 11.2,12.1,30.10) Tav. VI, 1-2 (T- 31.5, 36.3)
70	**Trino**	Settlement	1st - 2nd AD	CALABRESE, RINAUDO, RONCAGLIO 1991, p. 408, fig. 16,8
71	**Valperga**	Rural settlment	1st - 2nd AD	BRECCIAROLI TABORELLI, LEVATI 1989, Tav. XCIV, fig. 8-9.
72	**Vercelli**			
	Monastero della Visitazione	Settlement	1st AD 4th - 6th AD	VASCHETTI 1996, p. 177, figg. 122, 1-2 7 122,4/122,7-9/122,17 p. 180, fig. 124,10
	Ospedale S. Andrea	Settlement	Second half/end 1st AD	PANTÒ 1984, p. 145, Tav. LIX, n. 4
Regio IX - Liguria				
73	**Asti, fraz. Revignano**	*Villa rustica*	Second half 1st BC - first half 1st AD	ZANDA, ALESSIO, LEVATI 1989, p. 29, Tav. XI, 46
74	**Caprauna**	Votive deposit	1st - 2nd AD	CAPELLO 1941, p. 105, fig. 16,b p. 111, fig. 22
75	**Casteggio**	Necropolis	1st - 2nd AD	ROBINIO 2011, p. 168, Tav. X,6
76	**Monteu da Po**	Settlement	End 1st BC - 1st AD	ZANDA 2011, p. 66, figg. 11,5-6 p. 114, fig. 25,13 pp. 116, figg. 30,5-10 BACCI SPIGO 1979, p. 78 e p. 80, Tav. 3, 47
77	**Ticineto (AL), Loc.**	*Villa rustica*	1st - 2nd AD	GARERI 1980, p. 191, Tav. LX, types A1, A2

	Villaro			
78	**Ventimiglia**	Settlement	1st AD	OLCESE 1993, p. 170, p. 190, fig. 31,14
79	**Villa del Foro**	Settlement	1st - 2nd AD	CARLEVARIS 2015, fig. 5,2, p. 126.
Regio VIII – Aemilia				
80	**Barchessone Cappello**	Settlement	1st BC - 2nd AD	CORTI, TARPINI 1997, p. 122, p. 131, Fig. 7,2
81	**Bellaria**	Settlement	1st BC - 2nd AD	CORTI, TARPINI 1997, p. 131, Fig. 7,1
82	**Bologna**	Rural Settlements	1st - 4th AD	BERGAMINI 1980, Tav. LX, n. 1396, Tav. XXXI, n.704 e705, Tav. LV, n. 1259, Tav. LXI, n. 1397
83	**Bondeno**	Settlement	1st BC	CORNELIO CASSAI 1988, p. 206, Tav. X,7; Tav. XII,1
84	**Cassana**	*Villa rustica*	1st - 2nd AD	TRAVAGLI VISSER 1978, p. 90, fig. 106
85	**Faenza**	Settlement	Second half 1st BC - 2nd AD	BERGAMINI 1973, Tav. XIII, figg. 111, 113, 118 Tav. XV, fig. 123 Tav. XVI, figg. 143, 146 Tav. XVII, figg. 144, 145
86	**Finale Emilia**	Rural settlements	1st - 2nd AD	CORTI 2018, p. 208
87	**Gonzaga**			
	Loc. Prati Fiera	Settlement	1st - 2nd AD	BOTTURA 1988, p. 27, Tav. IV, M1
	Loc. Cadellora	Unknown	Early imperial age	BOTTURA 1988, p. 106, Tav. XXXI, M1
88	**Modena**	Settlement	1st AD	LABATE 1988, p. 64, fig. 36 RT1
89	**Russi**	*Villa rustica*	1st - first half 2nd AD	MAZZEO SARACINO 1977, p. 58, figg. 79, 339-340, fig. 80, 341 p. 132, fig. 79, 1360 p. 79, fig. 79,670, fig. 34, 3, fig. 80, 671
90	**San Basilio di Ariano**	Settlement	1st BC – 4th AD	TONIOLO 1984, p. 202, figg. 1, 7-9

91	**San Giovanni di Ostellato**	Settlement	1st AD	CORNELIO CASSAI 1984, p. 37, Tav. I,2
92	**Suzzara**	*Villa rustica* + pottery workshop	1st - 4th AD	BOTTURA 1988, p. 58, Tav. XIV, L3
93	**Tesa della Mirandola**	Settlement	1st - 4th AD	CORTI, TARPINI 2012, pp. 139-140, figg. 7, 1-4 CORTI, TARPINI 1997, p. 131, figg. 7,1-2
94	**Voghenza**	Necropolis	1st - 2nd AD	CORTI, TARPINI 2012, p. 141 BERTI 1984, pp. 131-134, t. 40, fig. 45, Tav. XXVII, 4-5 *Voghenza*, pp. 34-35, Tav. VII, 17-18
Regio V - Picenum				
95	**Porto Recanati**	Necropolis	Second half 1st - 2nd AD	CAPITANIO 1974, pp. 248-249, t. 63, figg. 132e, 134c p. 265, t. 87, fig. 157 p. 266, t. 92, fig. 159b p. 281, t. 115, fig. 185b
Out of Italy				
96	**Ivoševci - *Burnum***	Military settlement	1st BC - 1st AD	BORZIĆ 2014, p. 190, Tav. 1,15, 1,30
97	**Stari Trg - *Colatio***	Settlement	1st AD - First half 2nd AD	RUPEL 1988, c. 109, nota 26

Ollae 2				
N.	Place	Settlement/Necropolis/ Public Building/…	Chronology	Bibliography
Regio X – Venetia et Histria				
-*Ager* of Aquileia				
1	**Aquileia**			
	Area East of the *Forum*	Settlement	1st AD - 4th AD	RUPEL 1994, p. 201, Tavv. 26-27, Ccg 7-11
	Canale Anfora	Infrastructure	1st BC - 4th AD	CIVIDINI 2017, p. 241, type III, figg. 9.1-2
2	**Codroipo**	Settlement	1st AD	BUORA, CASSANI 1999, p. 112, Tav. XXXI, 3-6
3	**Pavia di Udine**	*Villa rustica*	1st AD	CASSANI 1991, type IVc, p. 96, fig. 12
4	**Sevegliano**	Settlement	1st AD	BUORA 1985b, c. 83, Tav. III, 13, 19 ZUCCOLO 1985, c. 46, Tav. I,2
5	**Vidulis**	*Villa rustica*	1st BC - 5th AD	RUPEL 1988, c. 110, type IX, fig. 13 c. 114, type XII, fig. 57 type XIII, figg. 58-59
-*Ager* of Trieste				
6	**Ronchi dei Legionari**	*Villa rustica*	1st BC - 4th AD	MANDRUZZATO 2008 , pp. 98, types 7.2 e 7.4, Tav. XIII, 5-6, 10 Tav. XIII, 14-16
7	**Villaggio del Pescatore**	Settlement	1st BC – 1st AD	AURIEMMA *et Alii* 2008, p. 169, Tav. II, 21
- *Ager* of Concordia				
8	**Polcenigo**	Necropolis	End 2nd BC - beginning 1st AD	DONAT 2015, p. 38, fig. 13
9	**San Giovanni Sottocolle**	Necropolis	1st BC – 1st AD	VITRI, DE CECCO *et Alii* 2008, p. 37, fig. 8,6 (g. 31), 8,7-8

- Carnia				
10	**Moggio Udinese**	Settlement	1st BC - beginning 1st AD	FALESCHINI 2018, p. 239, Tav. 4, 59-63.
11	**Raveo, Monte Sorantri**	Settlement + Sanctuary	1st AD	DONAT, RIGHI, VITRI 2007, p. 112, Fig. 22, 4 p. 114, Figg. 26,4; 26,6
- Regio X				
12	**Hrusica - *Ad Pirum***	Settlement	2nd- 4th AD	ULBERT 1981, Tav. 46, 14-22 Tav. 47, 1-5
13	**Krvavici**	*Villa rustica*	1st - 2nd AD	HARASA 2007, p. 105; pp. 154-155, Tav. 12, 1-6
14	**Ljubljana - *Emona***	Northern Necropolis	1st AD	PETRU 1972, T. 242, Tav. XXIII, n. 29 T. 264, Tav. XXV, n. 20 T. 653, Tav. XLIII, nn. 14-15 T. 37, Tav. LXXXII, n. 17 PLEŠNICAR-GEC 1972 T. 19, Tav. V, 11 T. 43, Tav. XI, 20 T. 53, Tav. XIII, 3 T. 94, Tav. XXIV, 3 T. 108, Tav. XXIX, 3 T. 112, Tav. XXX, 13 T. 116, Tav. XXXII, 13 T. 150, Tav. XLI, 16 T. 161, Tav. XLV,8 T. 188, Tav. LII, 4 T. 208, Tav. LVIII,4 T. 239, Tav. LXVI, 6 T. 266, Tav. LXXIII, 10 T. 267, Tav. LXXIII, 15

				T. 398, Tav. CVIII, 8-9-11 T. 539, Tav. CXXIV, 10 T. 619, Tav. CLXII, 15 T. 932, Tav. CLXXX, 4 PLEŠNICAR-GEC 1977, p. 80, Tav. 4, 13-19 PLEŠNICAR-GEC 1997, Tav. 1
15	**Loron**	*Villa rustica*	1st - 2nd AD	DUBOÉ 2001, p. 214, figg. 34 (2a); 36 (2b)
16	**Razdrto, loc. Mandrga**	Settlement	1st BC	HORVAT, BAVDECK 2009, p. 75, Tav. 7, 14-18, Tav. 30, 6-7
17	**Rovinj, Veštar bay**	Settlement (Harbour)	1st - 2nd AD	PEŠIĆ 2014, p. 74, figg. 1262; 1265
18	**Spodnje Škofije**	*Villa rustica* + pottery kiln	1st - 3rd AD	ŽERJAL 2011, p. 143, Tav. 4,2-4
19	**Vipava**	Necropolis	1st - 2nd AD	TRATNIK 2014, p. 296, T. 3D, Tav. 3,13 p. 297, T. 3B, Tav. 3,36 p. 297, T. 4, Tav. 10,71
Out of Italy				
20	**Ptuj - *Poetovio***	Necropolis	1st - 2nd AD	ISTENIČ 2000, p. 137, JrC1, fig. 129-130 Tav. 18,5, t. 85 Tav. 21,4, t. 97 Tav. 28,3, t. 133 Tav. 29,4, t. 138 Tav. 41,7, t. 197 Tav. 42,3, t. 200 Tav. 50,9, t. 249 Tav. 53,7, t. 265 Tav. 55,10, t. 274 Tav. 59,11, t. 292 Tav. 62,10, t. 307

				Tav. 64,5, t. 316 Tav. 65,11, t. 324 Tav. 73,5, t. 356 Tav. 74,2, t. 359 Tav. 84,5, t. 418 Tav. 89,9, t. 450 Tav. 100,2, t. 475 Tav. 137,5, t. 625 Tav. 154,2, t. 670 Tav. 155,3 t. 675 Tav. 164,6, t. 732

Ollae 7				
N.	Place	Settlement/Necropolis/ Public Building/…	Chronology	Bibliography
Regio X – Venetia et Histria				
-*Ager* of Aquileia				
1	**Aquileia**			
	Loc. Monastero	Pottery kiln	1st AD	STRAZZULLA RUSCONI 1979, c. 117, nota 142, (nn. inv. 87237, 90994, 90997, 91005)
	Loc. Santo Stefano	Necropolis	Not specified	GIOVANNINI 2005, nota 70, pp. 530-531, fig. 5
	Canale Anfora	Infrastructure	1st - beginning 2nd AD	CIVIDINI 2017, p. 239, fig. 7.1-2
	Area East of the Forum	Settlement	1st - 2nd AD	BUORA *et Alii* 1994, p. 74, Tav. XIII,3, Ccg 3 BUORA *et Alii* 1995, p. 151, Tav. XXI,3, Ccg 19 RUPEL 1991, p. 150, Tav. 20, Ccg 3 RUPEL 1994, p. 206, Tav. 26, Ccg 2-3
	Insula Forum/Fluvial Harbour	Settlement	1st AD (?)	BOTTOS 2018, p. 381, n. 1.5
	Via Bolivia	Settlement	Not specified	CEAZZI, DEL BRUSCO 2014, p. 944, Tav. 5,11
2	**Basaldella**			
	Loc. Menteressa	Grave	Not specified	DI CAPORIACCO, p. 88, fig. 166
	Loc. San Daniele	Necropolis	1st AD	CIVIDINI, DE CECCO *et Alii* 2016, p. 213
3	**Castions di Strada**			
	Morsano di Strada	Settlement	First half 1st AD	CIVIDINI 2002, p. 82, Tav. 13, Ccg 3
	Loc. Le Selve	Rural settlement	End 1st BC - beginning 1st AD	CIVIDINI 2002, p. 98, Tav. 23, Ccg 10-11
	Loc. Paradiso - Rem del Sterp	*Villa rustica*	1st AD	CIVIDINI 2002, p. 189, Tav. 75, Ccg 2

4	**Codroipo**			
	Via Pordenone	Settlement	End 1st BC - first half 1st AD	VENTURA, CIVIDINI 2007, pp. 225-226, Tav. III, 1-2
	South of via Pordenone	Settlement	End 1st BC - first half 1st AD	CIVIDINI, TIUSSI, VENTURA 2005, c. 392
	Piazza Marconi	Settlement	1st AD	BUORA, CASSANI 1999, p. 109-112, Tav. XXX, figg. 4-5-6 Tav. XXXI, figg. 1-2
5	**Joannis**	*Villa rustica*	1st AD (?)	STRAZZULLA RUSCONI 1979, cc. 64-67, Tav. VII, 2
6	**Lestizza**			
	Loc. Nespoledo	Necropolis	First half 1st AD	BUORA et *Alii* 2002, p. 95, t. 4, fig 5.1, t. 6, fig. 5.4, t. 8 B-C ,fig. 6.3
	Loc. Gallariano - Las Rives	Hillfort/Settlement	End 1st BC - 1st AD	CIVIDINI 2000, pp. 74-76, Tav. 20, Ccg 10-12
7	**Mereto di Tomba**, Loc. Cjaranducis	*Villa rustica* (?)	End 1st BC - beginning 1st AD	CIVIDINI 1998, p. 48, Tav. 2, Ccg 4
8	**Mortegliano**	Settlement	1st AD	CIVIDINI, MAGGI 1999, p. 154, Tav. 34, Ccg 1
9	**Pavia di Udine**			
	Sporadic	Unknown	Not specified	DI CAPORIACCO, p. 88, fig. 170
	Pavia di Udine	*Villa rustica*	End 1st BC - beginning 1st AD	CASSANI 1991, pp. 94-96
10	**Pozzuolo del Friuli**			
	Hillfort	Settlement	End 1st BC - beginning 1st AD	DONAT, FLOREANO, MERLATTI 2002, cc. 199-200, fig. 2,6
	Loc. Braida dell'Istituto	Necropolis	1st AD	ADAM *et Alii* 1983-84, pp. 205-208, fig. 35,1 DONAT 2016b, p. 223, fig. 5.2

11	**Rivignano**			
	Loc. Flambruzzo - Il Bosco	*Villa rustica* + pottery kiln	1st AD	MAGGI 2001, p. 89, Tav. 14, Ccg 5
	Sivigliano, Loc. Braidis	*Villa rustica* + pottery kiln	1st AD	MAGGI 2001, pp. 144-145, Tav. 28-29, Ccg 7-13
	Loc. Codis	*Villa rustica*	1st BC - 1st AD	MAGGI 2001, p. 198, Tav. 47, Ccg1
12	**San Daniele del Friuli**	Necropolis	Second half 1st AD	ZUCCOLO 1983, cc. 14-15, t. 2, fig. 1(n. inv. 165031)
13	**Sedegliano**, Loc. Turrida	*Villa rustica*	End 1st BC - first half 2nd AD	CIVIDINI 1997, p. 51, Tav. 5c, Ccg11-12-13
14	**Sevegliano**			
	Ploughsoil	Unknown	Not specified	BUORA 1985b, c. 83, Tav III, 13; 19
	Urban area	Settlement	1st AD	CASSANI 2008, pp. 116-117, Ccg50-54
	Sevegliano Ovest	Hole filled with amphorae	1st AD	ZUCCOLO 1985, c. 47, Tav. III,6, inv. 164495
15	Teor, Loc. Campomolle	*Villa rustica*	End 1st BC - 1st AD	MAGGI 1998, p. 62, Tav. 6, Ccg4 Tav. 7, Ccg5
16	**Udine**, Loc. S.Ovaldo	Necropolis	1st AD	DI CAPORIACCO, p. 73, figg. 137-138
17	**Varmo**, Loc. Cornazzai	*Villa rustica*	1st AD (?)	BUORA 2007, p. 198, Tav. 5, Ccg1
-*Ager* of Trieste				
18	**Aurisina**	*Villa rustica*	1st AD	MASELLI SCOTTI 1976, p. 75, Tav. III, fig. n
19	**Muggia Vecchia**	Settlement	1st AD	GIOVANNINI 1997, p. 72, Tav. 13,1
20	**Ronchi dei Legionari**	*Villa rustica*	1st AD	MADRUZZATO 2008, p. 95, Tav XI, 12-14, Tav XII, 1
21	**San Servolo**	Necropolis	1st AD	CASARI 2002, pp. 115-116, *olla* 50
22	**Trieste**			
	Via Crosada	Settlement	1st AD	*Trieste Antica,* p. 107, Tav. 24, figg. 5-6-7
	Via del Trionfo	Settlement	1st AD	TIUSSI, MANDRUZZATO 2006, p. 643, Tav. V,5

	Via Madonna del Mare	Infrastucture	First half 1st AD	MASELLI SCOTTI, DEGRASSI 2007, p. 102
	Curia Vescovile	Settlement	End 1st BC - beginning 1st AD	DEGRASSI, MASELLI SCOTTI 2008, p. 123
23	**Timavo (river's mouth)**	Settlement	1st AD	AURIEMMA *et Alii* 2008, p.169, Tav. VIII, 111; 113
- *Ager* of Concordia				
24	**Arzene, Loc. Pras di Sora**	Necropolis	Beginning 1st AD	CIVIDINI 2016, pp. 119-120, Tav. 3,1, fig. 6
25	**Chions**			
	Loc. Gheno	Ploughsoil assemblage	1st AD (?)	VENTURA, DONAT 2003, c. 408, fig. 3,11
	Loc. Villotta	Settlement	1st BC - 1st AD	VENTURA 2014, pp. 92-110, Tav. XIX, 1-2
26	**Concordia**	Settlement (well)	1st - 2nd AD	VIGONI 2009a, p. 147, fig. 26, 6
27	**Portogruaro, Loc. Giussago**	Necropolis	1st AD (?)	CROCE DA VILLA 2003, pp. 127-132, Tav. I, 1
- *Carnia*				
28	**Moggio Udinese**	Settlement	1st AD	FALESCHINI 2018, p. 239, p. 256, Tav. 4, 64–74, fig. 13
29	**Raveo, Monte Sorantri**	Votive deposit	1st AD	DONAT, RIGHI, VITRI 2007, p. 110, fig. 22, 1 p. 114, figg. 26,3; 26,7
30	**Verzegnis, colle Mazeit**	Settlement	End 1st BC - beginning 1st AD	VANNACCI LUNAZZI 2003, cc. 731-734, fig. 7.2 VANNACCI LUNAZZI 2008, p. 191
31	**Zuglio**	Settlement	1st AD	DONAT 2001, p. 383, nota 52
- *Regio X – Venetia et Histria*				
32	**Adria**	Pottery dump	1st AD	DE MIN, BONOMI *et Alii* 1986, p. 220, Tav. 6,64
33	**Fizine**	Settlement	End 1st BC - beginning 1st AD	GASPARI *et Alii* 2007, p. 186, p. 199, Tav. 2, 35
34	**Padova**	Grave	First half 1st AD	ROSSI 2011, p. 213, p. 238, Tav. 4
35	**Pula - *Pola***	Settlement	1st AD (?)	STARAC 1997, p. 154, Tav. IV.1

36	**Sermin**		1st BC - beginning 1st AD	HORVAT 1997, p. 107, Tav. 36,3-4
37	**San Simone/Simonov zaliv**	*Villa rustica*	End 1st BC - beginning 1st AD	GROH, SEDLMAYER 2017, p. 152, Tav. 2,16 Tav. 3,19-20 Tav. 4,5; 11 Tav. 7,3 Tav. 10,4-5 Tav. 14,14-15 Tav. 16,10 Tav. 24,4; 6-8

Ollae 8				
N.	Place	Settlement/Necropolis/ Public Building/…	Chronology	Bibliography
Regio X – Venetia et Histria				
-*Ager* of Aquileia				
1	**Aquileia**			
	Area East of the *Forum*	Settlement	1st AD	RUPEL 1994, p. 205, Tav. 30, Ccg 49-50 BUORA *et Alii* 1995, p. 149, p. 151, Tav. XXI, 1
	Loc. Colombara	Necropolis	End 1st - 2nd AD	GIOVANNINI, MANDRUZZATO, MASELLI SCOTTI, MEZZI, VENTURA 1997, cc.133-134, Tav. 16 cc. 147-148, Tav. 19 cc.151-152, Tav. 21
	Greath Baths	Infrastructure	1st - 3rd AD	BORCHIA 2008, pp. 96-97, Tav. II, 1
	Via Bolivia	Settlement	From a contaminated context	CEAZZI, DEL BRUSCO 2014, p. 944, Tav. 6,13
	Canale Anfora	Infrastructure	1st - 3rd AD	CIVIDINI 2017, pp. 240-241, figg. 8,1-2
	Insula Forum/Fluvial Harbour	Settlement	1st - 2nd AD	BOTTOS 2018, p. 379, Tav. IV,2
2	**Camino al Tagliamento,** Loc. Glauconicco	*Villa rustica*	1st AD	BUORA 2005, p. 98, Tav. 25, Ccg 8-9
3	**Castions di Strada**			
	Rem del Sterp	*Villa rustica*	Not specified	CASSANI, TERMINI 1991, p. 17
	Loc. Le Selve	Rural settlement	End 1st BC - 1st AD	CIVIDINI 2002, p. 99, Tav. 24, Ccg 12
	Castions di Strada	Ploughsoil materials	Not specified	CIVIDINI 2002, p. 133, Tav. 46, Ccg 5 p. 134, Tav. 47, Ccg 6

4	**Codroipo**			
	Piazza Marconi	Settlement	1st AD	BUORA, CASSANI 1999, p. 112, Tav. XXXI, 7
	Via Pordenone	Settlement (?)	First half 1st AD	VENTURA, CIVIDINI 2007, pp. 226-228, Tav. III,7
	South of Via Pordenone	Settlement (?)	1st AD	CIVIDINI, TIUSSI, VENTURA 2005, c. 392
5	**Joannis**	*Villa rustica*	First half 1st AD	STRAZZULLA RUSCONI 1979, Tav. VII, fig. 3
6	**Medea**	*Villa rustica*	Second half 1st AD	FURLANI 1971, cc. 11-12, figg. 8,1- 5
7	**Neblo borg**	Pottery and brick workshop	1st - 2nd AD	VIDRIH-PERKO, ŽUPANČIĆ 2011, p. 158, figg. 12,3-4
8	**Rivignano**			
	Loc. Il Bosco/Processione	*Villa rustica*	End 1st BC - end 1st AD	MAGGI 2001, p. 44, Tav. 3, Ccg 3
	Campomolle/Paludo	*Villa rustica*	Not specified	MAGGI 1998, p. 61, Tav. 6, Ccg 1
	Loc. Il Bosco	*Villa rustica* + pottery kiln	1st - 2nd AD	MAGGI 2001, p. 87, Tav. 13, Ccg 4
9	**Sedegliano**	*Villa rustica*	End 1st BC - first half 2nd AD	CIVIDINI 1997, p. 57, Tav. 5f, Ccg 24
10	**Talmassons**	Settlement	2nd - 4th AD	CIVIDINI, MAGGI 1999, pp. 159-161, Tav. 36, CCg 1
- *Ager* of Trieste				
11	**Ronchi dei Legionari**	*Villa rustica*	1st - 2nd AD	MADRUZZATO 2008, p. 96, Tav. XII,5-13
12	**Sermin**	Settlement	First half 1st AD	HORVAT 1997, pp. 108-111, Tav. 50,6
13	**Trieste**			
	Loc. Crosada	Settlement	3rd – 4th AD	*Trieste Antica,* p. 111, Tav. 26, Figg. 22-23; 26
	Piazza Barbacan	*Domus*	From a contaminated context	MASELLI SCOTTI et *Alii* 2004, p. 117, tav. X, 116
- *Ager* of Concordia				
14	**Villa di Villa**	Votive deposit	1st AD	MAIOLI 1987, pp. 81-82, Tav. 4,5

- Carnia				
15	**Verzegnis, colle Mazeit**	Settlement	End 1st BC - beginning 1st AD	VANNACCI LUNAZZI 2003, cc. 720, fig. 4.1
16	**Zuglio**	Settlement	1st AD	DONAT 2001, p. 383, Tav. 3,16
- Regio X – Venetia et Histria				
17	**Calvatone - *Bedriacum***	Settlement	1st - 2nd AD	DELLA PORTA 1991, p. 169, Tav. III, type c DELLA PORTA, SFREDDA 1993, pp. 92-94, Tav. III, 1-4
18	**Casaleone**	Ploughsoil materials	1st AD	CALZOLARI 1996, p. 97, Tav. XVI, 2
19	**Cerea**			
	Castello del Tartaro	Ploughsoil materials	1st - 2nd AD	CALZOLARI 1996, p. 89, Tav. III, 5
	Corte Negri	Ploughsoil materials	1st - 2nd AD	CALZOLARI 1996, p. 91, Tav. VI,1
	Est Scolo Menago nuovo	Ploughsoil materials	First half 1st AD	CALZOLARI 1996, p. 92, Tav. VII,7
	Corte Muri	Ploughsoil materials	End 1st BC - 1st AD	CALZOLARI 1996, pp. 93-94, Tav. XII, 1-2
20	**Chiunsano**	Rural settlement	1st - 3rd AD	CORTI 2016a, pp. 98-99, figg. 3, 37-46
21	**Costabissara**	Rural settlement	Middle 1st - 3rd AD	VIGONI, PETTENÒ 2005, p. 100, fig. 5,11
22	**Cremona**	Settlement	From the 1st AD	MARCHI 1996, p. 173, figg. 17-18
23	**Fizine**	Harbour	1st - 2nd AD	GASPARI *et Alii* 2007, p. 188, Tav. 5,120
24	**Krvavici**	*Villa rustica*	1st - 2nd AD	HARASA 2007, p. 105, Tav. 8,7, fig. 37
25	**Ljubljana - *Emona***	Necropolis	1st - 2nd AD	PLEŠNICAR-GEC 1972, t. 660, Tav. CLIII,18 PETRU 1972, t. 547, Tav. XXXVI, n. 5
26	**Loron**	*Villa rustica*	1st - 2nd AD	DUBOÉ 2001, p. 215, n. 38, fig. 40
27	**Manerbio**	Necropolis	Second half 1st AD	PORTULANO, RAGAZZI 2010, pp. 89-90, Tav. III, 13
28	**Montegrotto Terme**	Pottery workshop	1st - 3rd AD	MAZZOCCHIN 2004, p. 142, figg. 69-70, figg. 71,1-3 MARITAN, MAZZOLI *et Alii* 2006, pp. 257-258

29	**Musile di Piave**	Settlement	1st - 2nd AD	PETTENÒ, D'ISEP 2005, pp. 176-178, fig. 2,7
30	**Noventa di Piave**	Settlement	1st - 2nd AD	ASTA, CIVIDINI *et Alii* 2011, p. 21
31	**Padova**			
	Amphiteatre	public building	1st AD	MAZZOCCHIN *et Alii* 2006, p. 38, fig. 14,3
	Via Montona	Pottery workshop	1st - 4th AD	CIPRIANO, MAZZOCCHIN, ROSSIGNOLI 2006, p. 249, fig. 2,2 CIPRIANO, MAZZOCHIN, MARITAN 2011, pp. 208-209, figg. 3,10-13
	Church of S. Pietro	Settlement	1st - 3rd AD	VIGONI 2009b, p. 113, figg. 14,1-5
	Near *Meduacus* river	Artisanal area	Second half 1st - second half 2nd AD	CIPRIANO, MAZZOCHIN 2008, p. 200, fig. 10,4 p. 202, figg. 12,3; 12, 5
32	**Pula**	Necropolis	1st - 2nd AD	MATIJAŠIĆ 1991, t. 10, Tav. 5, fig. 2 t. 11, Tav,. 6, fig. 7 t. 25, Tav. 11, fig. 4 t. 70, Tav. 27, fig. 1 t. 113, Tav. 36, fig. 1 t. 127A, Tav. 38, fig. 6 t. 138, Tav. 41, fig. 2; 9
33	**Rodengo Saiano**	Settlement	3rd - 4th AD	BROGIOLO, BRUNO, MASSA 1986, p. 46, tav. III, n. 18-19
34	**Roncade, Ca' Tron**	Rural settlement	End 1st AD - beginning 2nd AD	BUSANA, CERATO et *Alii* 2008, p. 49, figg. 8,5-6
35	**Rovinj, Veštar bay**	Settlement	Second half 1st - beginning 2nd AD	PEŠIĆ 2014, p. 74, figg. 14; 39-40; 1292
36	**Sambruson di Dolo**	Settlement	From a contaminated context	ZAMPIERI 2009, pp. 162-164, Tav. LXVII,32-33 Tav. LXVIII, 34-35

37	**Spodnje Škofije**	*Villa rustica* +pottery workshop	1st - 3rd AD	ŽERJAL 2011, p. 143, Tav. 3,9, Tav. 4,10
38	**Torcello**	Settlement	1st - 3rd AD	LECIEJEWICZ et *Alii* 1977, figg. 84,1-3
39	**Vicenza**	Settlement	First half 1st AD	MAZZOCCHIN 2011, p. 300, fig. 10,6
40	**Villimpenta**	Ploughsoil materials	From a contaminated context	CALZOLARI 1989, fig. 65
Regio XI – Transpadana				
41	**Almese**	Necropolis	Second half 1st - end 3rd AD	GABUCCI 1996, pp. 76-77, t.1, Tav. XXVI, n. 1-2 t. 2, Tav. XXVI, n.1-2 t. 4,Tav. XXVII, n.1 t. 5, Tav. XXVII, n.1 t. 6, Tav, XXVII, n.1 t. 2; t.3, Tav. XXIX, n. 1-2
42	**Biella**	Necropolis	Second half 1st – 2nd AD	*Biella,* Tav. 16, 47B.2
43	**Caselette**	*Villa rustica*	1st AD	WATAGHIN CANTINO, LANZA, CROSETTO 1980, Tav. XLV, 18-20 Tav. XLVI, 21 REBAUDO GRECO 1980, Type 4, *passim*, Tav. XLVII Tav. XLIX,5-16 Tav. L,17-27
44	**Cavagliano**, Loc. Bellinzago	Pottery kiln	1st - 2nd AD	POLETTI 2006, Fig. 5, type 2
45	**Cavigliano**	Necropolis	Second half 1st - 2nd AD	MAZZI 2009, pp. 15-16, fig. 4

46	**Cerrione**	Necropolis	End 1st BC - first half 1st AD	BRECCIAROLI TABORELLI, DEODATO 2011, pp. 168-169,Type 3B, fig. 133
47	**Cozzo Lomellina**	Settlement	End 1st BC - 2nd AD	INVERNIZZI et *Alii* 1997, p. 54, Tav. 2, n. 14, p. 56, Tav. 3, n. 27
48	**Garlasco**	Necropolis	2nd - 3rd AD	VANNACCI LUNAZZI 1982, p. 96, t. 1, Tav. 4,1
49	**Ivrea**	*Villa rustica*	1st - 2nd AD	BRECCIAROLLI TABORELLI 1998, p. 72, Tav. XXXIII, 176-184
50	**Lomello**	Settlement	1st – 4th AD	BLAKE, MACCABRUNI 1987, p. 166, fig. 5, GTV 204/5
51	**Mariano Comense**	Settlement	2nd AD	BUTTI RONCHETTI 1987, p. 74, Tav. VI,26-27 p. 76, Tav. VII,38 p. 77, Tav. VII,49 p. 77, Tav. VIII,55 p. 80, Tav. IX,73 p. 82, Tav. X,95-97
52	**Milano**			
	Urban area	Settlements	1st AD	*Scavi MM3*, pp. 192-193, types 81-86, Tav. LXXXIX, 1-18
	Via Commedia	Necropolis	End 1st BC - first quarter 2nd AD	BOLLA 1988, p. 109, Tav. LXX,25/44
	Via San Vittore	Necropolis	Beginning 1st AD	BOLLA 1988, p. 144, Tav. CVI,54/5
	Parco Sempione	Unknown	Second half 1st - first half 2nd AD	BOLLA 1988, pp. 158-159, Tav. CXV,61/5
	Cimitero maggiore	Ploughsoil materials	1st AD	BOLLA 1988, pp. 164-165, Tav. CXXIII,62/25-26
	Università cattolica	Settlement	1st - 2nd AD	AIROLDI 2011, *passim*, fig. 3 CORTESE 2003, p. 68, Tav. 4,1-2
53	**Parabiago**	Necropolis	First half 1st AD	*Antichi Silenzi*, pp. 98-99, t. 17, Tav. 30,7

54	**Pavia**			
	Civic Tower	Settlement (?)	3rd - 4th AD	BLAKE 1978, p. 158, fig. 39, n. 38
	Scavi Seminario	Settlement	4th - 5th AD	NEPOTI, CORSANO 1995, p. 100, Tav. II,17
55	**Susa**			
	Urban area	Settlement	Second half 1st AD	BRECCIAROLI TABORELLI 1990, p. 87, Tav. XXXVIII,142-143; 146, Tav. XXXIX,147-152; 155-156, Tav. XLII,203-206; 208-212, Tav. XLV,249-253 Tav. XLVIII,269
	Suburban area	Isolated grave	End 2nd - beginning 3rd AD	GABUCCI 1996, p. 76
56	**Torino**	Settlement	1st AD	FILIPPI, MORRA 1989, pp. 119-120, Tav. XXXIX,4-5
57	**Vercelli**			
	Visitazione Abbey	Settlement	1st - 2nd AD	VASCHETTI 1996, p. 179, figg. 122,13-14
	S. Andrea hospital	Necropolis	Second half 1st AD	PANTÒ 1984, p. 145, Tav. LIX, 5
Regio IX – Liguria				
58	**Alba**			
	Palazzo Calisano	Settlement	1st - beginning 2nd AD	CAGNANA 1994, pp. 114-115, Tav. XXXIII, figg. 13-17 Tav. XXXIV, figg. 1-3
	San Cassiano	Necropolis	Second half 1st - first half 2nd AD	GABUCCI 1996, p. 76 FILIPPI 1982, p. 43, Tav. XXXVII,86, 134; 164-166; 217; 262; 286; 320; 345
	via Rossini	Settlement	1st - 2nd AD	QUERCIA 1997, pp. 494-496, fig. 2
	via Aqui	Domus	1st - 2nd AD	BERRUTO, LABRUZZO 2013, p. 42, figg. 5,10-13
	Urban area	Settlement	End 1st BC - 3rd AD	GARANZINI, QUERCIA 2016, p. 259, fig. 2
59	**Albenga**	Necropolis	Second half 1st AD	CAGNANA 1994, p. 114, note 44

				BULGARELLI, GERVASINI et *Alii* 2011, p. 130
60	**Albisola**	*Villa rustica*	Second half 1st AD	GANDOLFI, GERVASINI, CAPELLI 2004, p. 40, n. 31 BULGARELLI, TORRE 2004, p. 75
61	**Alessandria**			
	Loc. Villa del Foro – Roman road	Settlement	End 1st BC - middle 1st AD	FACCHINI 1995, p. 313, Tav. CXXXVI,9
	loc. Villa del Foro	Ploughsoil materials	Not specified	CARLEVARIS 2015, p. 126, fig. 5,1
62	**Asti**			
	via Grassi	Settlement	1st AD	ZANDA, CROSETTO, PEJRANI 1986, p. 89; p. 93, Tav. XXIII, 9/9
	Fraz. Rivignano	*Villa Rustica*	1st - 2nd AD	ZANDA, ALESSIO, LEVATI 1989, pp. 28-29 Tav. X, figg. 27-30; 32-34 Tav. XI, figg. 35-38
63	**Bene Vagienna – *Augusta Begiennorum***	Settlement	1st - 3rd AD	RATTO 2014, pp. 179-180, fig. 15 GARANZINI, QUERCIA 2016, p. 260, n. 27
64	**Cairo Montenotte**	Settlement	Second half 1st AD	GANDOLFI, GERVASINI, CAPELLI 2004, p. 40, n. 31 BULGARELLI, TORRE 2004, p. 75
65	**Caprauna**	Votive deposit	1st BC - 2nd AD	CAPELLO 1941 p. 105, fig. 13a p. 113, fig. 24 p. 117, fig. 31a GANDOLFI, GERVASINI, CAPELLI 2004, p. 40, fig. 5,1-3
66	**Casteggio**	Necropolis	1st - 4th AD	ROBINIO 2011, p. 168, Tav. XI, 1-6
67	**Diano Marina**	Settlement	1st - 3rd AD	GANDOLFI, GERVASINI, CAPELLI 2004, p. 40, n. 31

				BULGARELLI, GERVASINI et *Alii* 2011, p. 130
68	**Erli**	Necropolis	1st - 2nd AD	GANDOLFI, GERVASINI, CAPELLI 2004, p. 40, n. 31 BULGARELLI, GERVASINI et *Alii* 2011, p. 130
69	**Filattiera**	Settlement	1st AD	BULGARELLI, TORRE 2004, p. 75
70	**Isasco**	Necropolis	Second half 1st AD	CAGNANA 1994, p. 115, n. 45 BULGARELLI, GERVASINI et *Alii* 2011, p. 130
71	**Mezzanego**	Settlement + workshop	1st - 2nd AD	BULGARELLI,TORRE 2004, p. 75
72	**Monteu da Po - *Industria***	Settlement	End 1st BC - second half 1st AD	BACCI SPIGO 1979, p. 78; p. 80, Tav. 3,42-43 ZANDA 2011, p. 66, figg. 11,1-3 pp. 111-114, figg. 25,1-5 pp. 116-117, figg. 30,1-4 GARANZINI, QUERCIA 2016, p. 260, nota 28
73	**Nice, Loc. Cimiez**	Settlement	1st - 2nd AD	GRANDIEUX 2004, p. 144, Tav. LXXVIII,1-5
74	**Noli**	Necropolis	End 1st - 2nd AD	BULGARELLI, GERVASINI et *Alii* 2011, p. 130
75	**Perti**	Necropolis	1st AD	CAGNANA 1994, p. 115, n. 45 BULGARELLI, GERVASINI et *Alii* 2011, p. 130
76	**Pietra Ligure**, Loc. Corti	*Villa rustica*	1st AD	BULGARELLI, GERVASINI *et Alii* 2011, p. 130, figg. 3, 13-20 BULGARELLI, TORRE 2004, p. 74 CHIOCCI 1999, pp. 133-134, Tav. 18,3-10
77	**Poirino**	Necropolis	1st - 2nd AD	FILIPPI 1987, pp. 174-176, Tav. XXXIV,31-36 Tav. XXXV,43
78	**Pollenzo**	Necropolis	Second half 1st - beginning 2nd AD	FILIPPI 2006, p. 129, fig. 1,2 GARANZINI, QUERCIA 2016, p. 260, n. 26
79	**Quiliano**	Rural Settlement	Middle 1st - 3rd AD	GANDOLFI, GERVASINI, CAPELLI 2004, p. 40, n. 31 BULGARELLI, TORRE 2004, p. 74

				BULGARELLI, GERVASINI *et Alii* 2011, p. 130
80	**Rivanazzano**	Ploughsoil materials	1st BC	BUSINARO, FACCIO *et Alii* 1997, p. 166, Tav. 4,14
81	**Roccaforte Ligure**	Settlement	Second half 1st AD	GANDOLFI, GERVASINI, CAPELLI 2004, p. 40, n. 31
82	**Rocchetta Palafea**	Settlement	Middle 1st AD	ZANDA, LEVATI 1991, p. 119, Tav. LXIV, 18-19
83	**Sanremo**	Settlement	1st - 3rd AD	GANDOLFI, GERVASINI, CAPELLI 2004, p. 40, n. 31 BULGARELLI, GERVASINI et Alii 2011, p. 130
84	**Tortona**	Necropolis	1st – 3rd AD	DEAZZA 2013, p. 65, fig. 6, 5
85	**Vado Ligure**	Settlement	End 1st BC - first half 2nd AD	CAGNANA 1994, p. 114, n. 44 BULGARELLI, TORRE 2004, p. 76, figg. 8-9 BULGARELLI, GERVASINI et *Alii* 2011, p. 130, figg. 3,5-12
86	**Val Ponci**	Settlement	Second half 1st AD	GANDOLFI, GERVASINI, CAPELLI 2004, p. 40, n. 31
87	**Ventimiglia**			
	Via del Cardine	Settlement	Second half 1st - beginning 3rd AD	OLCESE 1993, pp. 108-110, figg. 15,28-36 pp. 196-198, fig. 34
	Albintimilium	Necropolis	Second half 1st AD	CAGNANA 1994, p. 114, n. 44
Regio VII – Etruria				
88	**Luni - *Luna***	Settlement	1st - 4th AD	*Luni I,* p. 424, Tav. 75,16.CM 2774/2; 17.CM2623/2; 18.CM2623/1 Tav. 110,6.CM 1476 *Luni II,* p. 207, p. 622, Gruppo 33b, Tav. 134,1 CM 3054
Regio VIII – Aemilia				
89	**Bondeno**	Settlement	1st - 4th AD	CORTI, TARPINI 1997, p. 121 CORNELIO CASSAI 1988, pp. 204-206,

				Tav. X, nn. 4-6 Tav. XI, nn. 1-6
90	**Budrio**	Settlement	1st AD	LABATE 1988, p. 62, fig. 35
91	**Cassana**	*Villa rustica*	1st AD	TRAVAGLI VISSER 1978, pp. 89-90, figg. 102-104; 111 CORTI, TARPINI 1997, p. 121
92	**Faenza**	Settlement	1st - 2nd AD	BERGAMINI 1973, Tav. XIII,figg. 114-115 Tav. XV, fig. 124 Tav. XVII, figg. 140-141
93	**Fossa di Concordia**	Settlement	1st - 4th AD	CORTI 2001, p. 128, fig. 1
94	**Gonzaga**			
	Loc. Prati Fiera	Domus	1st - 2nd AD	BOTTURA 1988, p. 27, Tav. IV, M2-M6
	Corte Merzetelle	Unknown	1st BC - 1st AD	BOTTURA 1988, pp. 78-79, Tav. XXI, M3-6
	Corte Panizza	Rural *domus*	From a contaminated context	BOTTURA 1988, p. 100; p. 103, Tav. XXX, M4
95	**Massa Finalese**	Ploughsoil materials	1st AD	CORTI, TARPINI 1997, p. 122; p. 131, fig. 6,5
96	**Modena**	Settlements	1st - 2nd AD	*Modena 1988,* p. 433, fig. 378,5; fig. 379,7; 9; fig. 381,1 p. 438, fig. 383,12; fig. 384,10 LABATE 1988, pp. 62-64, olle RT I B, fig. 35
97	**Mortizzuolo**	Ploughsoil materials	1st AD	CORTI, TARPINI 1997, p. 122; p. 131, fig. 6,2
98	**Pegognaga**			
	Loc. Corte Vecchia	Rural *domus*	1st - 2nd AD	BOTTURA 1988, pp. 38-41, Tav. VIII,M 13-18 Tav. IX,M19-27 Tav. X,M28-29 p. 43, Tav. XI,43-45
	Bonifica Mantovana	*Domus*	1st BC - 1st AD	BOTTURA 1988, p. 82, Tav. XXXII, M10

	San Lorenzo	Old collections	Second half 1st - 4th AD	TAMASSIA 1996, pp. 228-229, figg. 26.21-22
99	**Poviglio**	Ploughsoil materials	1st AD	CORTI, TARPINI 1997, p. 121
100	**Russi**	*Villa rustica*	1st - first half 2nd AD	MAZZEO SARACINO 1977, p. 48, fig. 80,206
101	**San Basilio di Ariano Pol**	*Villa rustica*	Not specified	TONIOLO 1984, p. 201, figg. 1,1-4
102	**San Benedetto Po**	Settlement	1st BC - 2nd AD	BOTTURA 1988, pp. 109-111, Tav. XXXIV, M1-3
103	**San Giovanni di Ostellato**	Settlement	1st AD	CORNELIO CASSAI 1983-84, p. 37, Tav. I, 3
104	**Schivenoglia**	Necropolis (?)	1st AD	BOTTURA 1988, p. 97, Tav. XXVIII, M1
105	**Serravalle a Po**	Settlement	Not specified	CALZOLARI 1989, figg. 203; 233; 256
106	**Sustinente**	Settlement	Not specified	CALZOLARI 1989, figg. 172; 197
107	**Tesa della Mirandola**	Ploughsoil materials	1st - 3rd AD	CORTI, TARPINI 2012, p. 137, fig. 6
108	**Voghenza**	Necropolis	1st - 3rd AD	*Voghenza*, pp. 34-35, Tav. VII, n. 15-16; 20 BERTI 1984, p. 159, t. 59, Tav. XXXVI, 2
Regio V – Picenum				
109	**Fermo**	Ploughsoil materials	1st - 2nd AD	MENCHELLI *et Alii* 2010, p. 246, figg. 7,29-31
110	**Porto Recanati**	Necropolis	End 1st AD - second half 2nd AD	CAPITANIO 1974, t. 17, p. 179, fig. 49e, t. 46, p.230, fig. 113c, t. 52, p. 237, fig. 124; fig. 126a t. 192, p. 340, fig. 260b
Out of Italy				
111	**Baška**	Necropolis	1st - 2nd AD	KONESTRA 2015a, p. 120, fig. 5
112	**Caraglio**	Public building	1st - 2nd AD	MOLLI BOFFA 1980, p. 258, Tav. LXXX, h-i CAGNANA 1994, p. 114

113	**Ivoševci - *Burnum***	Settlement	2nd AD	BORZIĆ 2014, p. 190; p. 293, Tav. 1,12
114	**Nin**	Necropolis	1st - 2nd AD	KONESTRA 2013, p. 263
115	**Omisalj**	Necropolis	1st - 2nd AD	KONESTRA 2014, p. 263; p. 277, Tav. II, cat. 5-6 KONESTRA 2015a, p. 120 , fig. 5,1;5
116	**Senj**	Settlement	1st - 2nd AD	KONESTRA 2015a, p. 120, fig. 5
117	**Vid - *Narona***	Temple	1st - 2nd AD	TOPIĆ 2004, p. 306; pp. 338-339, Tav. 26,106-108

Ollae 9				
N.	Place	Settlement/Necropolis/ Public Building/…	Chronology	Bibliography
Regio X – Venetia et Histria				
-*Ager* of Aquileia				
1	**Alnicco**	Isolated grave	End 1st AD	BUORA 1991, pp. 118-120, Fig.1
2	**Aquileia**			
	Loc. S. Stefano	Habour facilities	1st AD	DONAT, MAGGI *et Alii* 2007, p. 164
	Essiccatoio Nord	Public building	1st AD	DONAT, MAGGI *et Alii* 2007, p. 188
	Fluvial harbour	Public building	1st AD	DONAT, MAGGI *et Alii* 2007, p. 188, n. 169
3	**Basaldella**	Necropolis	End 1st BC - beginning 2nd AD	CIVIDINI, DE CECCO, *et Alii* 2016, p. 213
4	**Basiliano**	Settlement	1st AD (?)	CIVIDINI, MAGRINI 2003, c. 772
5	**Cassacco**	Ploughsoil materials	End 1st BC	CIVIDINI 2006, p. 53
6	**Castions di Strada**			
	Loc. Cjalminis	*Villa rustica*	Beginning 1st AD	CIVIDINI 2002, p. 55, Tav. 6, Ccg 1
	Morsano di Strada	Settlement	1st AD	CIVIDINI 2002, p. 83, Tav. 13, Ccg 1
	Loc. Le Selve	Rural settlement	End 1st BC - 1st AD	CIVIDINI 2002, p. 97, Tav. 21, Ccg 1
	Loc. Tre Ponti	*Villa rustica*	1st AD (?)	CIVIDINI 2002, p. 133, Tav. 46, Ccg 1-2
	Loc. Paradiso– Rem del Sterp	*Villa rustica*	1st AD	CIVIDINI 2002, p. 187, fig. 18 CASSANI, TERMINI 1991, pp. 17-18, (n. inv. 264838)
7	**Cividale**			
	Loc. Corte Romana	Settlement	First half 1st AD	BORZACCONI 2005, pp. 118-119
	Loc. Borgo di Ponte	Necropolis	End 1st BC - first half 1st AD	DONAT, MAGGI *et alii* 2007, pp. 194-195
8	**Codroipo**			
	Loc. Patoc/Lonca	*Villa rustica* +necropolis	End 1st BC - 1st AD	CIVIDINI 1996, pp. 83-84, tav. 24, CCg 1-2

	Piazza Marconi	Settlement	Beginning 1st AD	BUORA, CASSANI 1999, p. 105-108, Tav. XXVII-XXIX
	ex-Querini	Settlement (?)	End 1st BC - beginning 1st AD	BUORA, CASSANI 2001, p. 82, Tav. I,4-5; Tav. II,1
	South of Via Pordenone	Settlement (?)	1st AD (?)	CIVIDINI, TIUSSI, VENTURA 2005, c. 392
	via Pordenone	Necropolis (?)	1st AD	VENTURA, CIVIDINI 2007, pp. 223-225, Tav. II,1-7
9	**Coseano**	*Villa rustica*	3rd AD (?)	RUPEL 1988, c.112; c. 125, fig. 139
10	**Fagagna**			
	Loc. Plasencis	Ploughsoil materials	From a contaminated context	BUORA 1981, c. 196, fig. 11
	Loc. Brunelde	Necropolis (?)	End 1st BC - First half 1st AD	CIVIDINI 2006, p. 68, fig. 79 ROSSET 2002, *passim*
11	**Joannis**	*Villa rustica*	1st BC - 1st AD	STRAZZULLA RUSCONI 1979, c. 73, Tav. VII,1
12	**Lestizza**			
	Loc. Monte nero Scalunicco	Necropolis	1st AD	BUORA 1989, p. 101, fig. 12
	Villacaccia, loc. Vieris	Ploughsoil materials	From a contaminated context	CIVIDINI 2000, p. 30, Tav 1, Ccg 1
	Grovis di Nespoledo	Settlement (?)	Not specified	CIVIDINI 2000, p. 40, Tav. 6, Ccg 2
	Loc. Galleriano	*Villa rustica*	End 1st BC - 1st AD	CIVIDINI 2000, pp. 72-73, Tav. 19, Ccg 1-7
	Loc. Santa Maria di Sclaunicco	*Villa rustica*	Not specified	CIVIDINI 2000, p. 30
	Nespoledo di Lestizza	Necropolis	First half 1st AD	BUORA *et Alii* 2002, p. 100, fig. 7,2
13	**Lovaria**	Settlement	1st AD	DONAT, MAGGI *et Alii* 2007, p. 164

14	**Mereto di Tomba**	Ploughsoil materials	1st AD	Scheda 24115, *ERPAC FVG*
15	**Neblo Borg**	Pottery and brick workshop	1st – 2nd AD	VIDRIH-PERKO, ŽUPANČIĆ 2011, p. 158
16	**Osoppo**	Necropolis	Beginning 1st AD	CIVIDINI 2006, p. 84
17	**Palazzolo dello Stella**	Underwater excavation	1st AD	BRESSAN 1997, c. 450, fig. 4.
18	**Pavia di Udine**			
	Loc. Fondi Beretta-Vorago	Necropolis	1st AD (?)	CAPORIACCO 1976, p. 88, fig. 171
	Pavia di Udine	*Villa rustica*	End 1st BC - beginning 1st AD	CASSANI 1991, p. 98, fig. 16
19	**Pocenia**	Ploughsoil material	From a contaminated context	DONAT, MAGGI *et Alii* 2007, p. 192
20	**Pozzuolo del Friuli**			
	Loc. Braida dell'Istituto	Necropolis	First half 1st AD	ADAM et *Alii* 1983-84, pp. 206-208, figg. 35.2-3
	Loc. Carpeneto	Necropolis	First half 1st AD	BUORA 1984, c. 20
21	**Rivignano**			
	Loc. Il Bosco/Processione	*Villa rustica*	1st AD (?)	MAGGI 2001, pp. 42-43, Tav. 3, Ccg 1-2
	Flambruzzo/Loc. Il Bosco	*Villa rustica* + pottery kiln	Beginning 1st AD	MAGGI 2001, pp. 86-88, Tav. 13, Ccg 1-2
	Sivigliano, Loc. Braidis	*Villa rustica* + pottery kiln	1st AD	MAGGI 2001, pp. 19-141, Tav. 27, Ccg 1-6
22	**San Daniele del Friuli**	Necropolis	1st AD	ZUCCOLO 1983, cc. 16-17, fig. 3
23	**Sedegliano, Loc. Turrida**	*Villa rustica*	First half 1st AD	CIVIDINI 1997, pp. 47-50, Tav. 5a; Tav 5b, Ccg 1-9

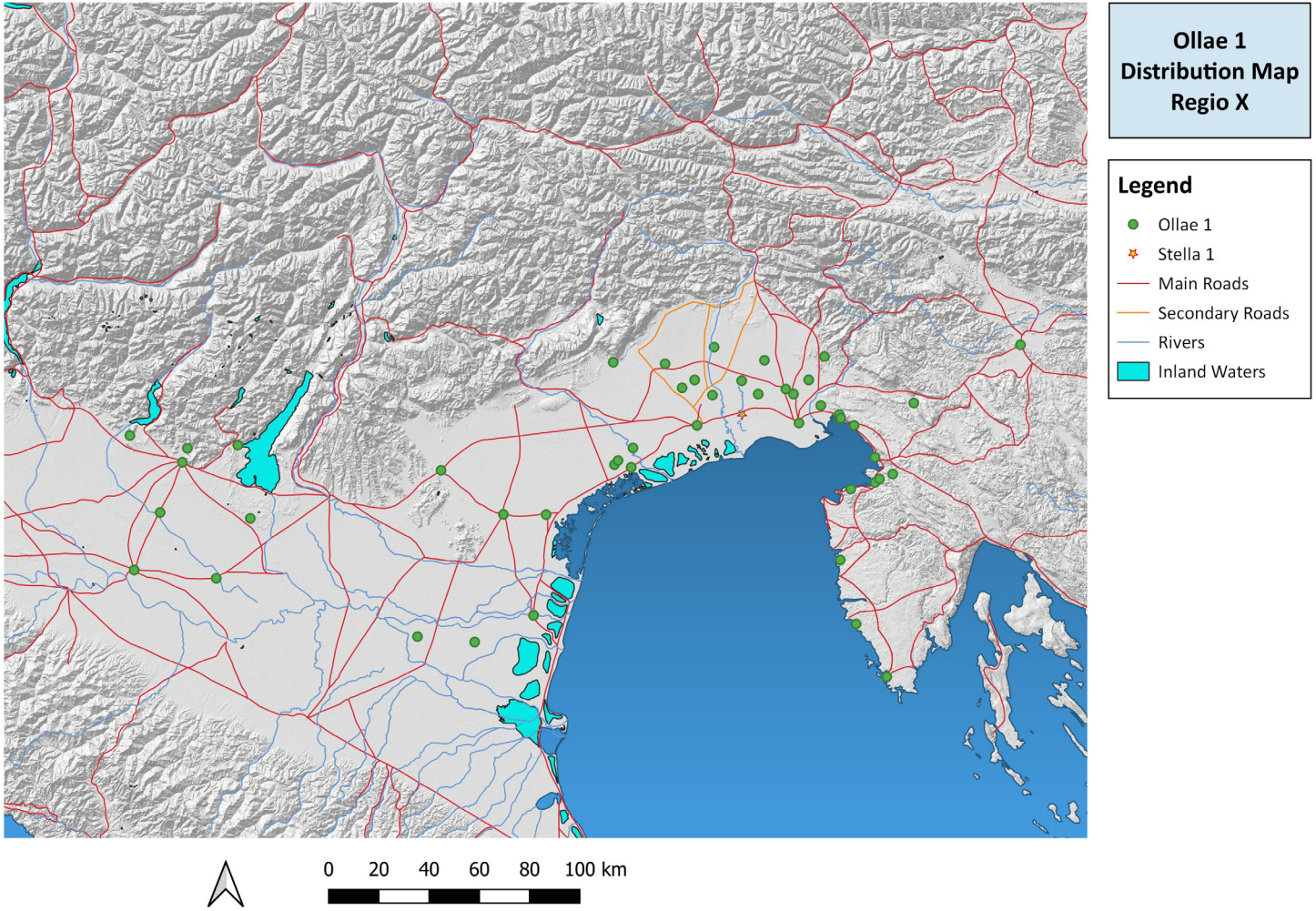
24	**Sevegliano**	Settlement	1st AD	CASSANI 2008, pp. 113-116, Ccg 47-49
25	**Udine**			
	Porta Pracchiuso	Necropolis	1st AD	DI CAPORIACCO 1976, pp. 79-85, fig. 57 BUORA 1984, cc. 19-20 DONAT, MAGGI *et Alii* 2007, p. 171
	Loc. S. Osvaldo	Necropolis (?)	1st AD	DI CAPORIACCO 1976, p. 72, fig. 135
	Loc. S. Gottardo	Unknown	Not specified	DI CAPORIACCO 1976, pp. 65-66, fig. 136; 142; 144; 146
	Le Angorie di Molin Nuovo	Ploughsoil materials	Beginning 1st AD	DI CAPORIACCO 1976, p. 109
	Along the Comor (?)	Ploughsoil materials	From a contaminated context	DI CAPORIACCO 1976, fig. 58 BUORA 1984, c. 21
	Unknown	Unknown	Not specified	DI CAPORIACCO 1976, p. 100, fig. 171
26	**Vidulis**	*Villa rustica*	1st AD	RUPEL 1988, c. 108; c. 109, fig. 1
- *Ager* of Trieste				
27	**Locavaz**	Pottery workshop	End 1st BC - 1st AD	MASELLI SCOTTI 1987, pp. 437-443, fig. 5. FAILLA, MASELLI SCOTTI, SANTORO 1997, p. 133 VENTURA 2014, pp. 72-74
28	**Ronchi dei Legionari**	*Villa rustica*	1st AD	MANDRUZZATO 2008, p. 96, Tav. XII, figg. 2-3
29	**Trieste, Loc. Crosada**	Settlement	Second half 1st AD	*Trieste Antica* p. 108, Tav. 24, figg. 8-9
- *Ager* of Concordia				
30	**Chions**			
	Loc. Gheno	Ploughsoil materials	Beginning 1st AD	VENTURA, DONAT 2003, c. 408, fig. 3,10
	Loc. Villotta	Settlement	1st AD	VENTURA 2014, p. 102

31	**Concordia Sagittaria**	Settlement	End 1st BC - beginning 2nd AD	VIGONI 2009a, p. 145, figg. 24,2-3 p. 147, fig. 26,5
32	**Pasiano di Pordenone**	Rural Settlement	End 1st BC - beginning 2nd AD	TIRONE, BEGOTTI 1996, p. 94, nr. 1, fig. 23
33	**San Vito al Tagliamento, Loc. Gorgaz**	*Villa rustica*	1st AD	BUORA 1984, c. 22. BUORA 1985a, p. 79; p. 81, fig. 3 VENTURA, DONAT 2003, cc. 408-409, figg. 4,14-15
- Carnia				
34	**Moggio Udinese**	Settlement	1st AD (?)	FALESCHINI 2018, p. 231, n. 13
35	**Montereale Valcellina**	Settlement	Beginning 1st AD	CORAZZA, DONAT et *Alii* 1997, c. 486 SPANGHERO, VITRI et *Alii* 2002, c. 781, fig. 5.2
36	**Invillino**	Settlement	1st AD	FINGERLIN, GARBSCH, WERNER 1968, c. 104, fig. 9, 1-7
37	**Raveo, Monte Sorantri**	Settlement Votive deposits	1st AD	DONAT, FLÜGEL, PETRUCCI 2006 , p. 213 DONAT, RIGHI, VITRI 2007, p. 110, figg. 22,1-3 p. 114, figg.26,1-2;5 VITRI, DONAT, MAIR *et Alii* 2007, fig. 2,8 DONAT, MAGGI et alii 2007, pp. 159-164, pp. 198-200
38	**Verzegnis, colle Mazeit**	Settlement	End 1st BC - beginning 1st AD	VANNACCI LUNAZZI 2008, pp. 189-194. VANNACCI, LUNAZZI 2003, c. 722, Tav. 3,1-4, cc. 732-733, Tav. 7,7-8
39	**Zuglio**	Settlement	End 1st BC	DONAT 2001, p. 381, Tav. 2, fig. 13
- Regio X – Venetia et Histria				
40	**Aviano, Loc. Presutta**	Rural necropolis	End 1st BC - 1st AD	VITRI 1990, p. 22; p. 24, nr. 3, fig. 9; nr. 2, fig. 8
41	**Calalzo di Cadore – loc. Lagole**	Sancutuary	1st AD	BRUSTIA 2001, p. 308; p. 316, figg. 598-605

42	**Ljubljana/Emona**	Settlement	Beginning 1st AD	PLEŠNICAR-GEC 1977, p. 88
43	**Mezzocorona**	Settlement	1st AD (?)	AVANZINI, BUSCHETTI *et Alii* 1994, pp. 100-102, Tav. I, 2; 4; 6
44	**Padova**			
	Via SS. Martino e Solferino	Settlement	1st AD	CIPRIANO 2005a, p. 153, fig. 6
	Amphitheatre	Settlement	1st AD	MAZZOCCHIN et *Alii* 2006, p. 38, fig. 13,5
	Via Montona	Necropolis + pottery workshop	1st – 2nd AD	CIPRIANO, MAZZOCHIN, ROSSIGNOLI 2006, p. 248, fig. 2,2
45	**Roncade, Loc. Ca' Tron**	Rural settlement	End 1st AD - beginning 2nd AD	BUSANA, NICOSIA *et Alii* 2011, p. 57, nota 10
46	**Santa Lucia di Tolmino/ Most na Soci**	Necropolis	Beginning 1st AD	DONAT, MAGGI *et Alii 2007*, p. 192 p. 170, fig. 10
47	**Vipava, Laurinova ulica**	Necropolis	Beginning 1st AD	TRATNIK 2014, p. 280, Tav. 15, fig. 114
Out of Italy				
48	**Aguntum**	Settlement	Middle 1st AD – 2nd AD	KLIMESCH 1995, pp. 121-123 DONAT, MAGGI *et Alii* 2007, p. 179 AUER 2017, p. 121, fig. 13a, AG61 e AG68, fig. 18a, AG62 e AG70
49	**Aica**	Necropolis	Second half 1st AD - first half 2nd AD	DONAT, MAGGI *et Alii* 2007, p. 193
50	**Aislingen**	Settlement	1st AD	FLÜGEL, SCHINDLER KAUDELKA 1995, c. 82, n. 17
51	**Auerberg**	Settlement	End 1st BC - beginning 2nd AD	FLÜGEL, SCHINDLER KAUDELKA 1995, Tav. 4, 23-24; 26-28; 30-31
52	**Augsburg - *Augusta***	Settlement	1st AD	DONAT, MAGGI *et Alii* 2007, p. 153

53	**Carnuntum**	Military settlement	1st AD	GRÜNDERWALD 1979, pp.53-54, Tav. 40,5-12 Tav. 41,1-14 Tav. 42,1-8 GRÜNDERWALD 1983, pp. 40-41, Tav. 53,1-21
54	**Crikvenica**	Ploughsoil materials	From a contaminated context	KONESTRA 2015, p. 119
55	**Gudon - *Gufidaun***	Settlement	1st AD	DONAT, MAGGI *et Alii* 2007, p. 153
56	**Gurina**	Settlement Votive deposits	1st AD	FLÜGEL, SCHINDLER KAUDELKA 1995, Tav. 3, 13-15 BUORA 2002, c. 512 DONAT, FLÜGEL, PETRUCCI 2006, p. 21
57	**Kempten**	Necropolis	End 1st - beginning 2nd AD	FLÜGEL, SCHINDLER KAUDELKA 1995, Tav. 4, 25; 29; 32-33 DONAT, MAGGI *et Alii* 2007, p. 193, n. 201
58	**Lorenzberg (Epfach)**	Settlement	1st AD	ULBERT 1965, pp. 87-91 FLÜGEL, SCHINDLER KAUDELKA 1995, c. 82, n. 14; 16
59	**Magdalensberg**	Settlement	1st AD	FLÜGEL, SCHINDLER KAUDELKA 1995, Tav. 1-2, SCHINDLER KAUDELKA, ZABEHLICKY-SCHEFFENEGGER 2007, *passim*
60	**Ptuj - *Poetovio***	Necropolis	1st AD	ISTENIČ 2000, p. 140, fig. 131, LG/JrC6
61	**San Lorenzo di Sebato**	Settlement	1st AD	DONAT, MAGGI *et Alii* 2007, p. 153
62	**Tires**	Necropolis	Second half 1st AD – first half 2nd AD	DONAT, MAGGI *et Alii* 2007, p. 193

Appendix II.
Distribution maps


Ollae 1
Distribution Map
Regio X
Legend
Ollae 1
Stella 1
Main Roads
Secondary Roads
Rivers
Inland Waters
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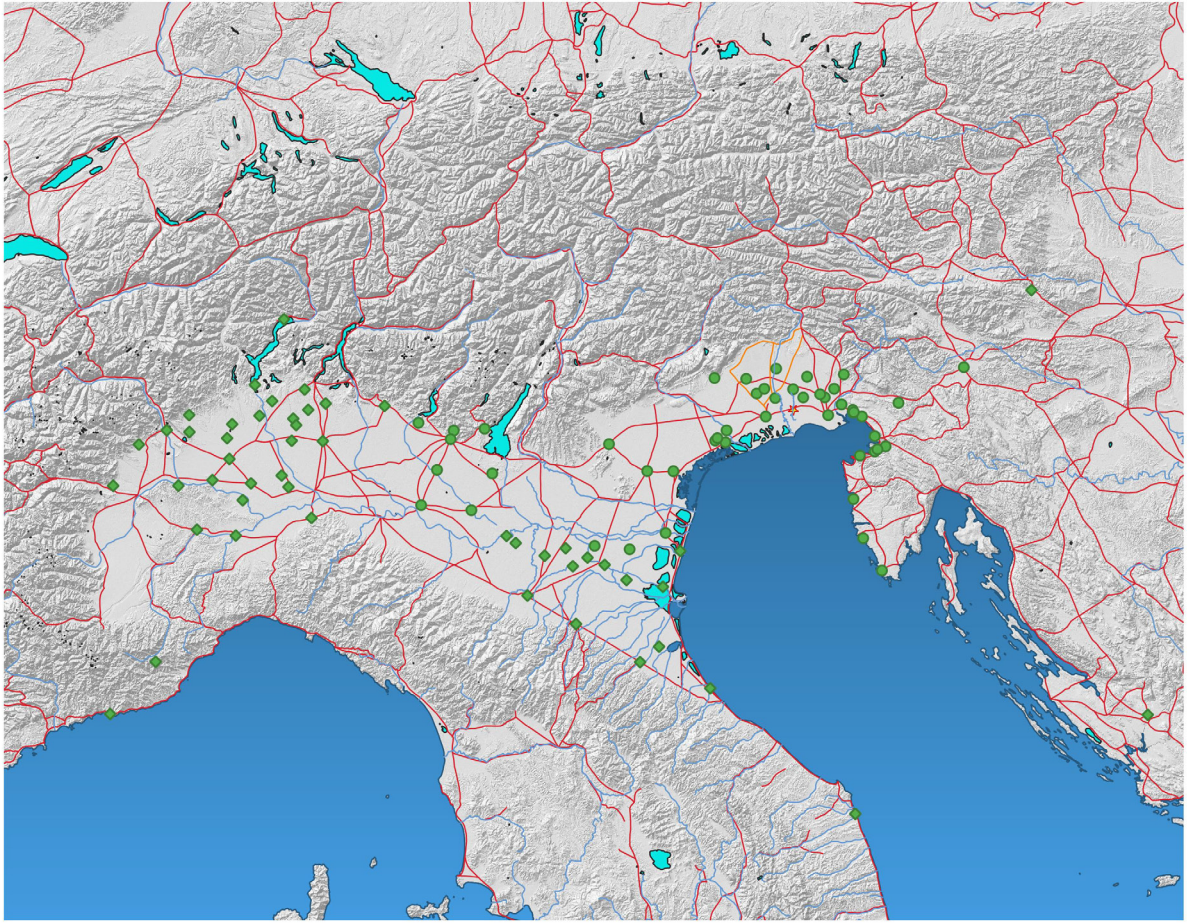
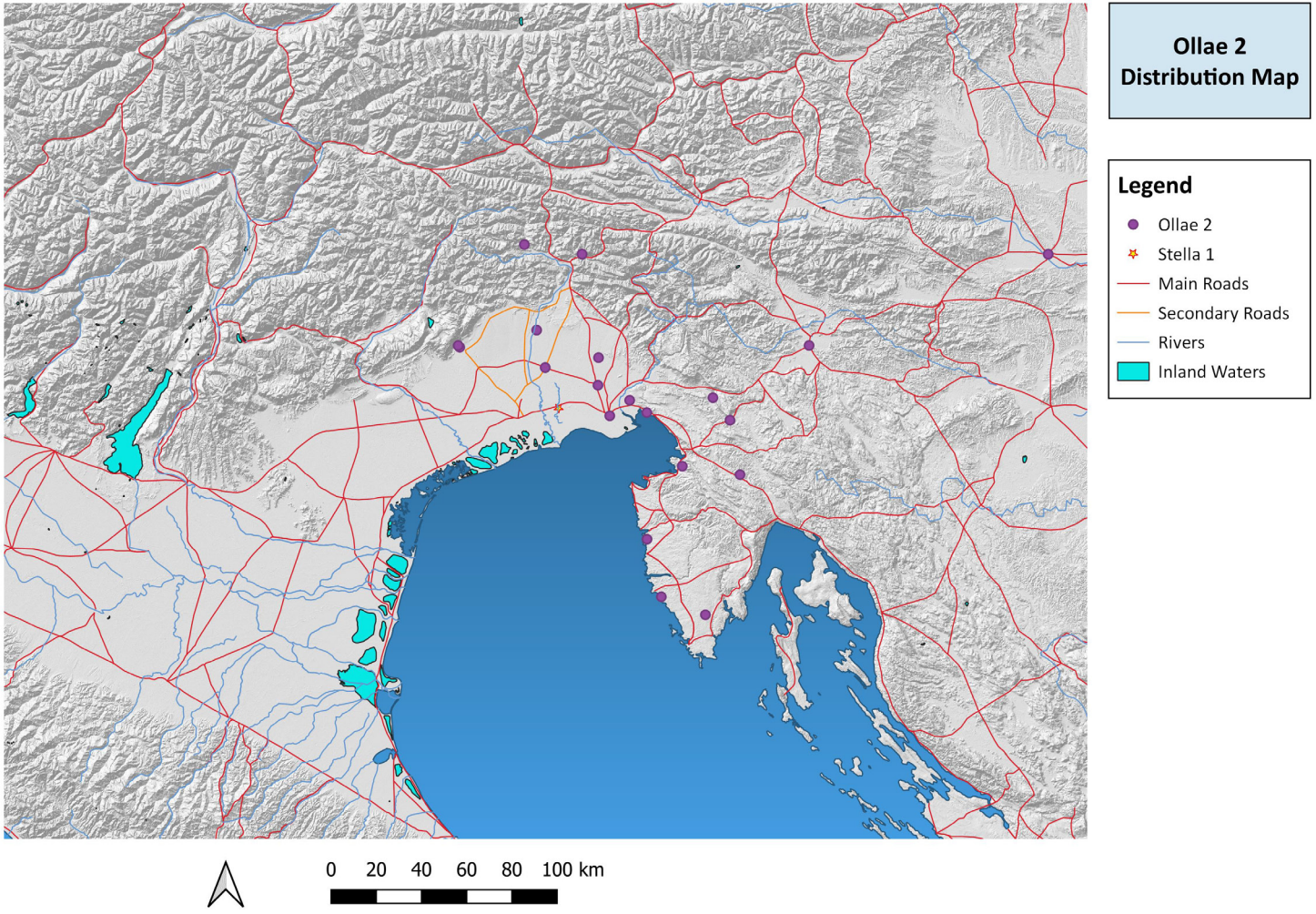

Ollae 1
Distribution Map
Northern Italy
Legend
Ollae 1 - N. Italy
Ollae 1 - X Regio
Stella 1
Main Roads
Secondary Roads
Rivers
Inland Waters
0
50
100
150
200
250 km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Legend
Ollae 2
Stella 1
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Secondary Roads
Rivers
Inland Waters
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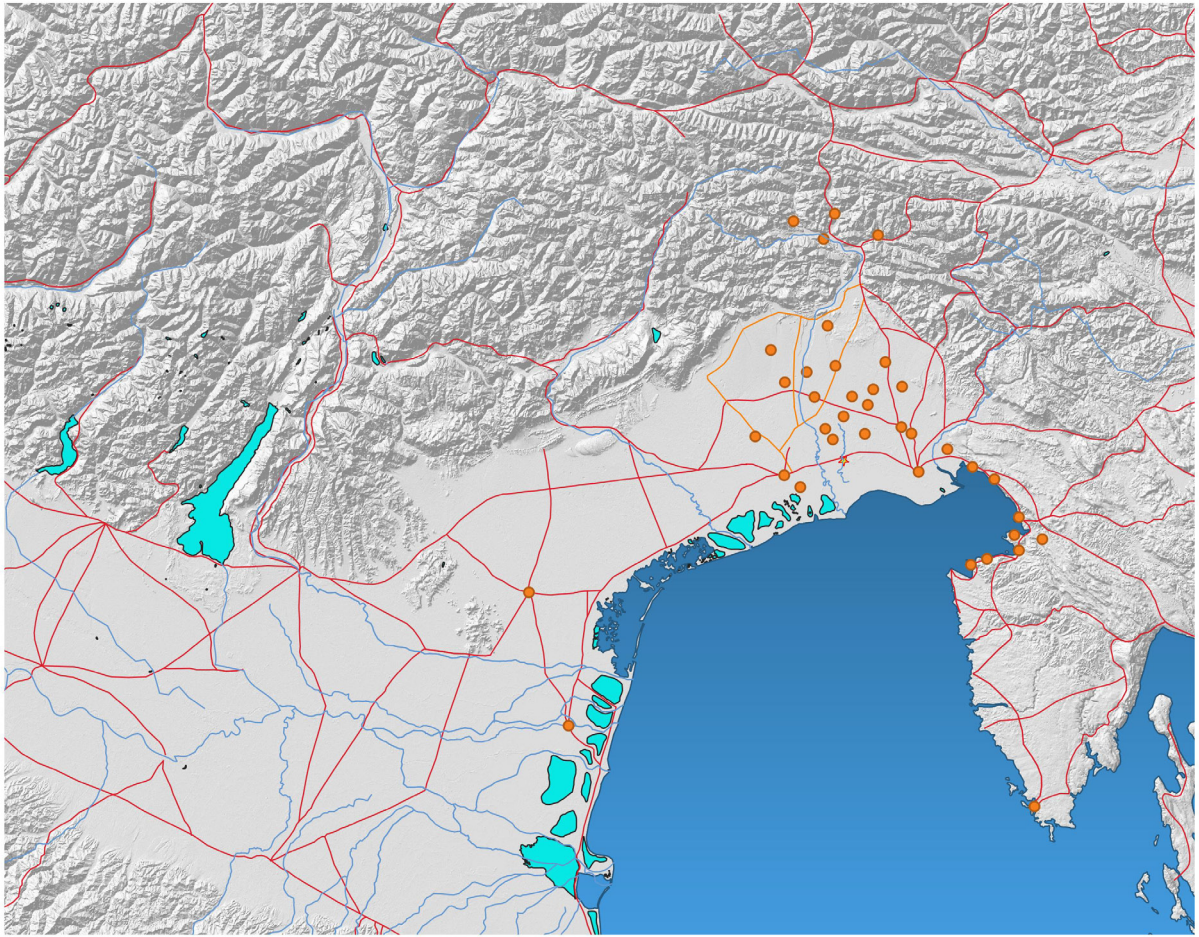
Ollae 7
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Regio X
Legend
Ollae 7
Stella 1
Main roads
Secondary roads
Rivers
Inland waters
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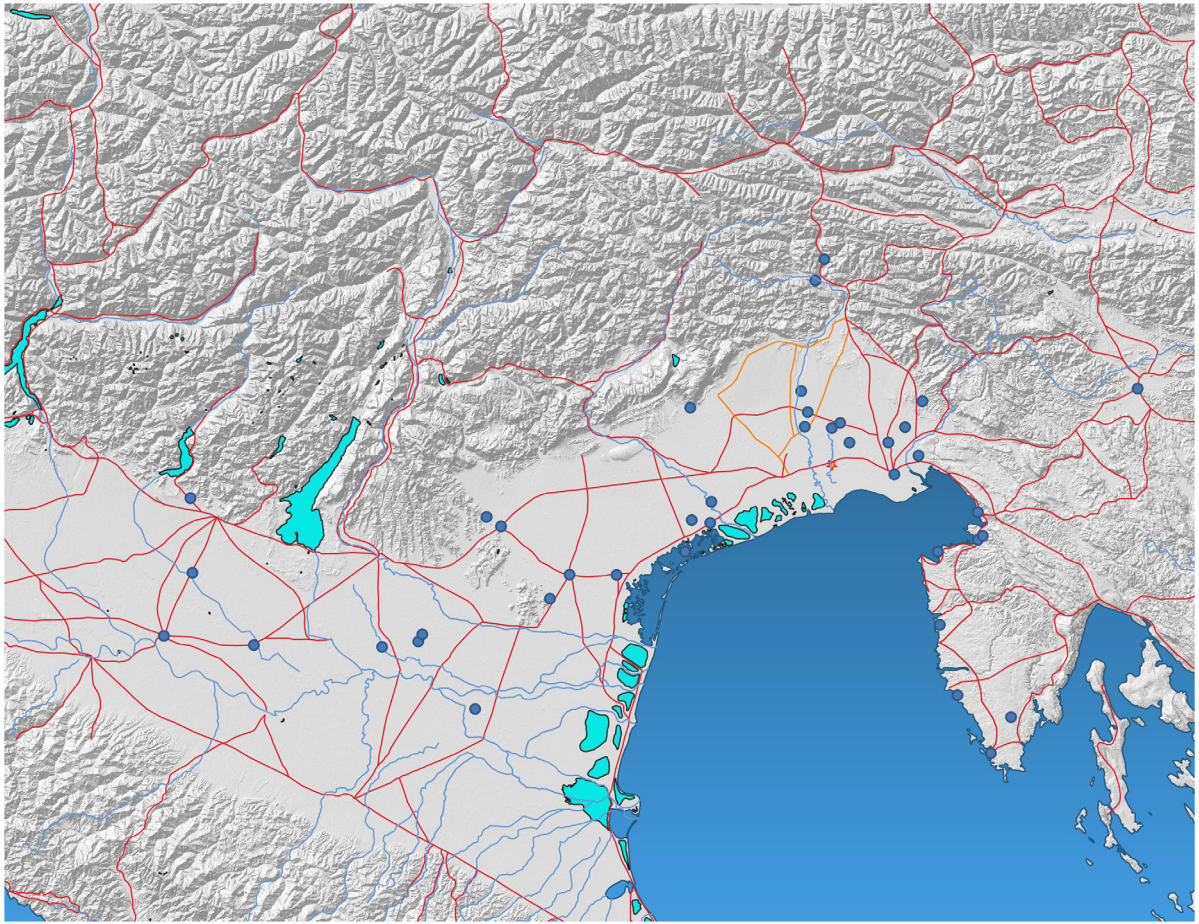
40
60
80
100 km


Ollae 8
Distribution Map
Regio X
Legend
Ollae 8
Stella 1
Main Roads
Secondary Roads
Rivers
Inland Waters
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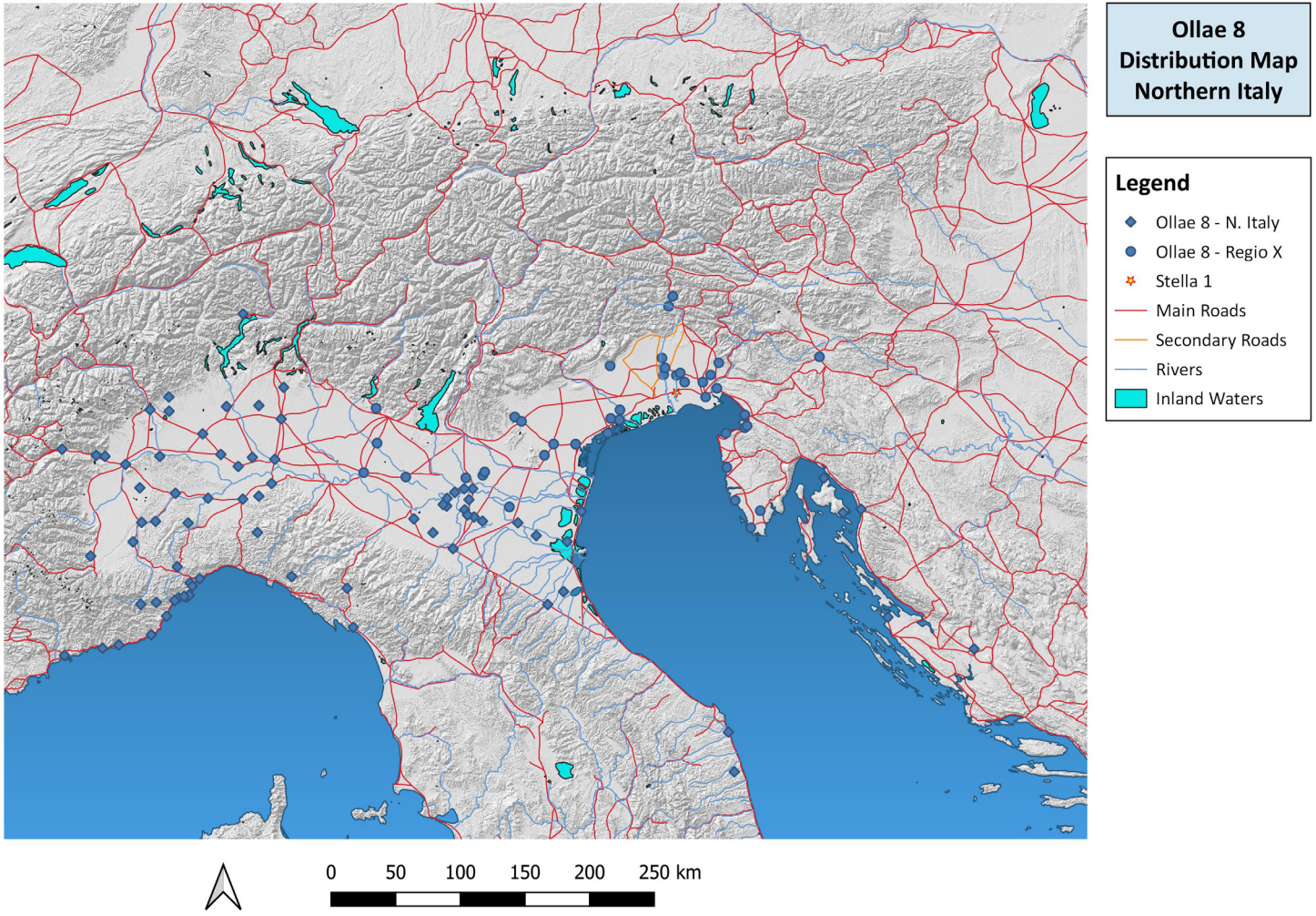
Ollae 8
Distribution Map
Northern Italy
Legend
Ollae 8 - N. Italy
Ollae 8 - Regio X
Stella 1
Main Roads
Secondary Roads
Rivers
Inland Waters
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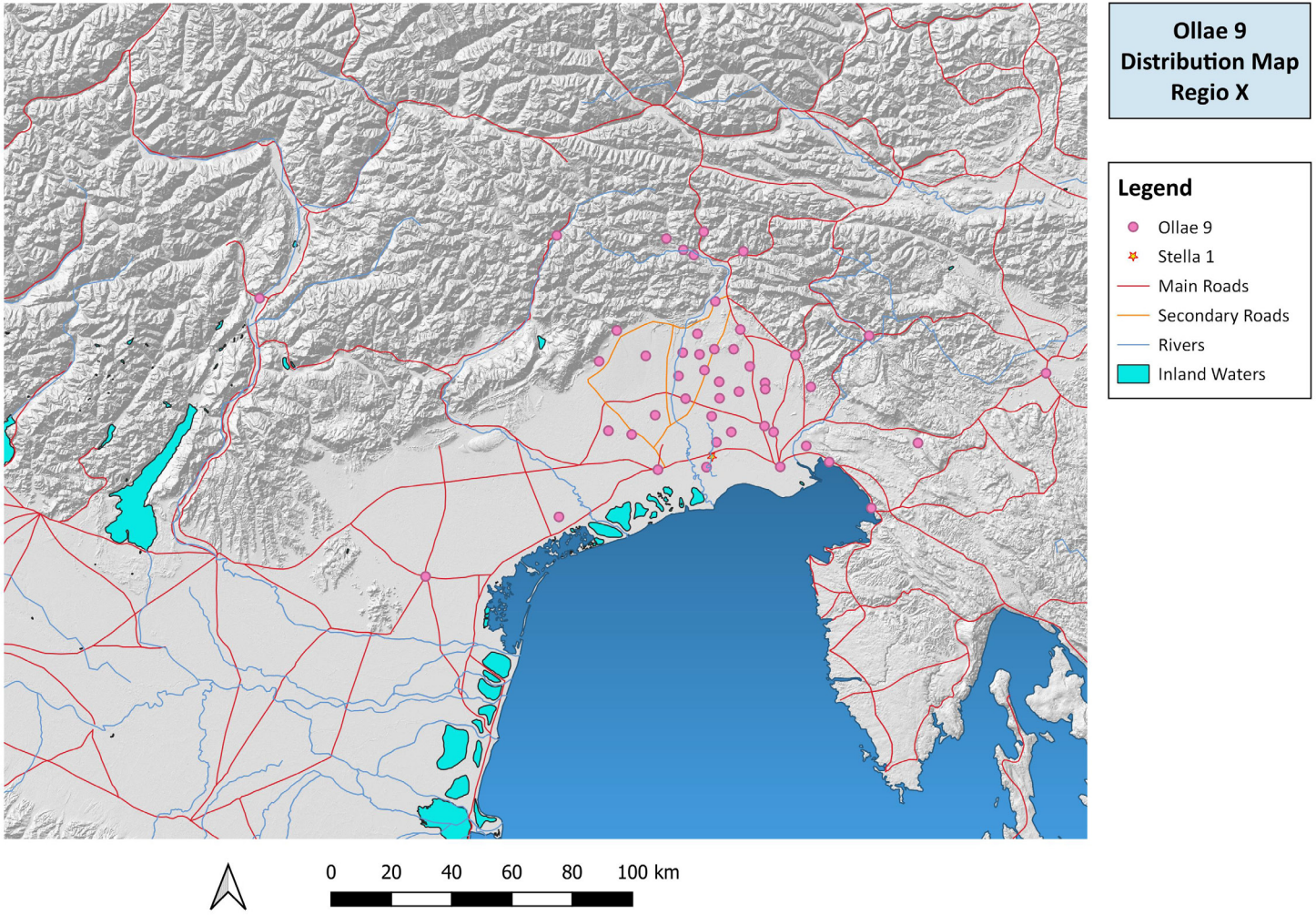
250 km


Ollae 9
Distribution Map
Regio X
Legend
Ollae 9
Stella 1
Main Roads
Secondary Roads
Rivers
Inland Waters
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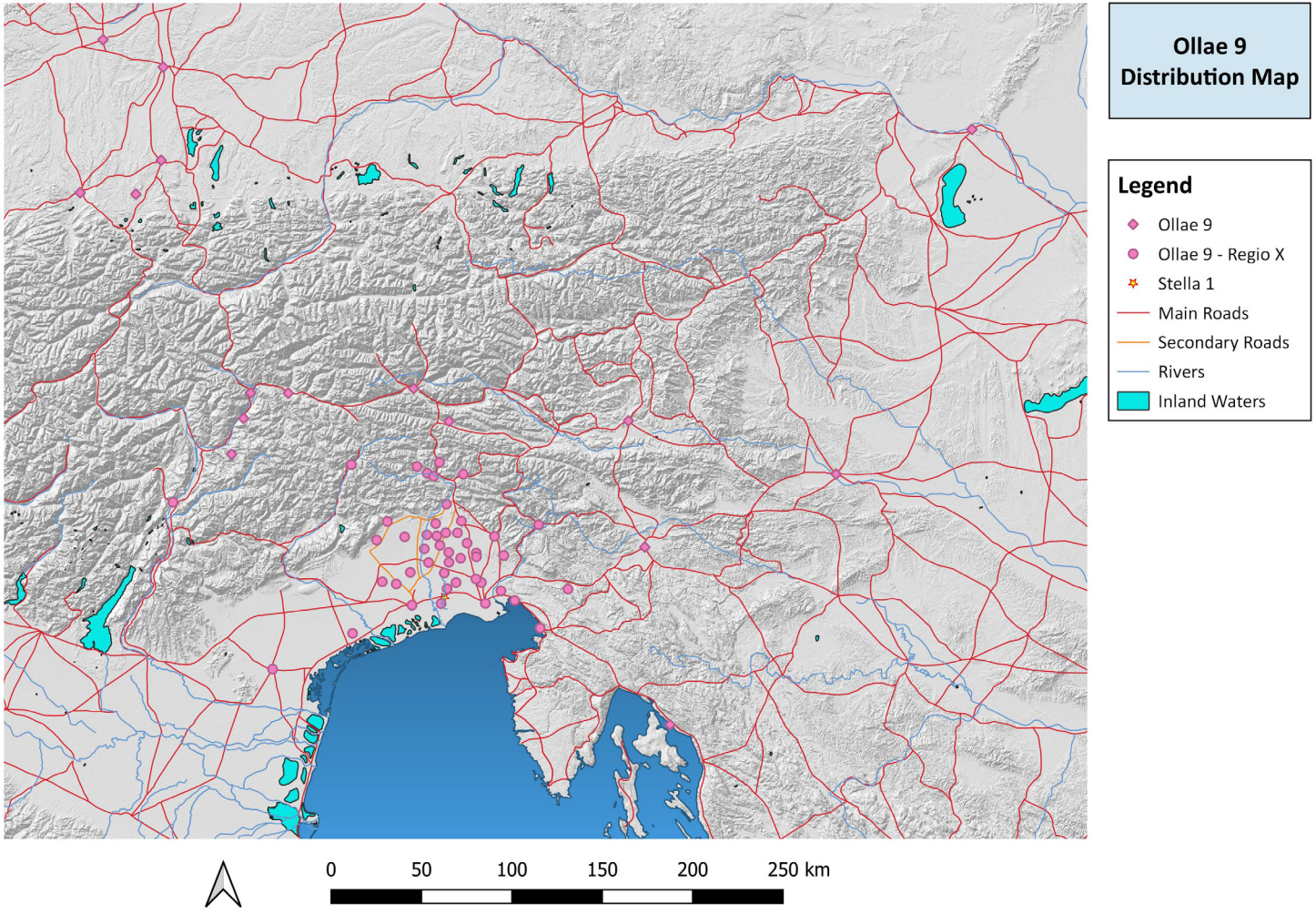
Ollae 9
Distribution Map
Legend
Ollae 9
Ollae 9 - Regio X
Stella 1
Main Roads
Secondary Roads
Rivers
Inland Waters
0
50
100
150
200
250 km

Appendix III.
Tables of chronologies

Ollae 1: Chronology

Place	1st half 1st BC	2nd half 1st BC	1st half 1st AD	2nd half 1st AD	1st half 2nd AD	2nd half 2nd AD	3rd AD	4th AD	5th AD
Regio X – Venetia et Histria									
Aquileia			x	x	x	x			
Castions di Strada		x	x	x					
Joannis			x	x					
Medea				x					
Neblo Borg			x	x	x	x			
Pozzuolo del Friuli			x	x					
Rivignano, Loc. Flambruzzo		x	x	x	x	x			
Sedegliano, Loc. Turrida		x	x	x	x	x			
Sevegliano	x	x							
Duino Aurisina			x	x					
Locavaz			x	x					
Moschenizze		x	x	x	x				
Ronchi dei Legionari			x	x	x	x			
Sermin	x	x	x						
Socerb/San Servolo		x	x						
Timavo (river's mouth)	x	x	x	x					
Trieste - Loc. Crosada		x	x	x	x	x	x	x	
Chions, Loc. Gheno			x						
Concordia		x	x	x					
Morsano al Tagliamento			x						
San Vito al Tagliamento, Loc. Gorgaz			x	x					
Torre di Pordenone			x	x	x	x			
Villa di Villa			x	x					
Adria		x	x						
Adro			x	x	x	x			
Brescia		x	x	x					
Calvatone			x	x	x	x			
Cavriana			x						
Chiunsano			x	x	x	x			

Cremona		x	x	x					
Ljubljana - *Emona*			x	x	x	x			
Loron			x	x	x	x			
Manerbio			x	x	x	x			
Meolo			x	x	x	x			
Musile di Piave		x	x						
Nave (BS)			x	x					
Noventa di Piave					x				
Padova			x	x					
Pula		x	x	x	x	x			
Ro Ferrarese			x	x	x	x			
Roncade – Ca' Tron			x	x	x	x			
Rovigno, Vestar bay				x	x				
Salò, Lugone				x					
Sambruson di Dolo				x					
Simonov zaliv				x					
Spodnje Škofije			x	x	x	x	x		
Vicenza			x	x					
Vipava , Laurinova ulica			x	x	x	x			
Regio XI - Transpadana									
Angera						x	x	x	
Arsago Seprio				x	x	x			
Bergamo			x	x	x	x			
Biella			x	x	x	x			
Carpignano Sesia				x	x				
Caselette		x	x	x					
Cerrione			x	x	x	x			
Corbetta		x	x	x	x	x			
Cozzo Lomellina		x	x	x					
Gambolò		x	x						
Garlasco		x	x	x					
Greggio	x	x	x	x	x	x			
Ivrea		x	x	x					
Legnano				x	x				
Locarno - Solduno				x	x	x	x		
Lurate Caccivio				x	x	x			
Mariano Comense				x	x	x			
Milano			x	x	x	x			
Oleggio		x	x	x	x				
Parabiago				x					
Rovello Porro			x	x					

Trino			x	x	x	x			
Valperga			x	x	x	x			
Vercelli			x	x				x	x
Regio IX - Liguria									
Asti		x	x						
Caprauna			x	x	x	x			
Casteggio			x	x	x	x			
Monteu da Po		x	x	x					
Ticineto, Loc. Villaro			x	x	x	x			
Ventimiglia			x	x					
Villa del Foro			x	x	x	x			
Regio VIII - Aemilia									
Barchessone Cappello	x	x	x	x	x	x			
Bellaria	x	x	x	x	x	x			
Bologna			x	x	x	x	x	x	
Bondeno	x	x							
Cassana			x	x	x	x			
Faenza		x	x	x	x	x			
Finale Emilia			x	x	x	x			
Gonzaga			x	x	x	x			
Modena			x	x					
Russi			x	x	x				
San Basilio di Ariano	x	x	x	x	x	x	x	x	
San Giovanni di Ostellato			x	x					
Suzzara			x	x	x	x	x	x	
Tesa della Mirandola			x	x	x	x	x	x	
Voghenza		x	x	x	x	x			
Regio V - Picenum									
Portorecanati				x	x	x			
Out of Italy									
Ivoševci - *Burnum*	x	x	x	x					
Stari Trg - *Colatio*			x	x	x				

Ollae 2: Chronology

Place	1st half 1st BC	2nd half 1st BC	1st half 1st AD	2nd half 1st AD	1st half 2nd AD	2nd half 2nd AD	3rd AD	4th AD	5th AD
Regio X – Venetia et Histria									
Aquileia			x	x	x	x	x	x	
Codroipo			x	x					
Pavia di Udine			x	x					
Sevegliano			x	x					
Vidulis	x	x	x	x	x	x	x	x	x
Ronchi dei Legionari			x	x	x	x	x	x	
Villaggio del Pescatore	x	x	x	x					
Polcenigo	x	x	x						
San Giovanni Sottocolle	x	x	x	x					
Moggio Udinese	x	x	x	x					
Raveo			x	x					
Hrusica - *Ad Pirum*						x	x	x	
Krvavici			x	x	x	x			
Ljubljana - *Emona*			x	x					
Loron			x	x	x	x			
Razdrto, loc. Mandrga	x	x							
Rovinj, Veštar bay			x	x	x	x			
Spodnje Škofije,			x	x	x	x	x		
Vipava			x	x	x	x			
Out of Italy									
Ptuj - *Poetovio*			x	x	x	x			

Ollae 3: Chronology

Ollae	1st BC	1st AD	2nd AD	3rd AD	4th AD	5th AD	6th AD	7th AD	8th AD
V147/AP973+AP1030	x	x							
V127/AP1636+AP1646	x	x							
V138/AP1625	x	x							
V150/AP519	x	x							
V156/AP400	x	x							
V168/AP987	x	x							
V 128/AP1697			x	x	x	x	x	x	
V144/AP4							x	x	
V129 /AP13							x	x	
V158/AP718+AP826							x	x	
V137/AP982		x	x	x	x	x	x		
V155/AP599	x	x	x	x	x	x	x		
V135/AP1294					x				
V142/AP1230					x	x	x		
V162/AP1431						x	x	x	x
V132/AP215					x	x	x	x	x
V133/AP363					x	x	x	x	x
V141/AP401					x	x	x	x	x
V145/AP342					x	x	x	x	x
V151/AP778					x	x	x	x	x
V164/AP1632					x	x	x	x	x
V160/AP1103					x	x	x	x	
V161/AP287					x	x	x	x	
V163/AP222									
V159/AP455+AP482+AP560	x	x							
V166/AP1388+AP1391+AP1403					x	x	x	x	
V165/AP1464					x	x	x	x	
V167/AP757					x	x	x	x	

Ollae 4: Chronology

Ollae	4th BC	3rd BC	2nd BC	1st BC	1st AD	2nd AD	3rd AD	4th AD	5th AD
V174/AP1489				x					
V170/AP1623				x					
V171/AP1260				x					
V148/AP709					x	x	x	x	
V172/AP1668					x	x	x	x	
V218/AP169		x	x	x	x				
V176/AP1634		x	x	x	x				
V175/AP297		x	x						
V173/AP263	?	?	?	?	?	?	?	?	?

Ollae 5: Chronology

Ollae	1st BC	1st AD	2nd AD	3rd AD	4th AD	5th AD	6th AD	7th AD
V177/AP827+AP877+AP986+ AP989+AP1694	x	x						
V178/AP460				x	x			
V179/AP753				x	x	x	x	x

Ollae 6: Chronology

Ollae	first half 1st BC	second half 1st BC	first half 1st AD	second half 1st AD	first half 2nd AD	second half 2nd AD
V184/AP278		x	x	x		
V180/AP846		x	x	x		
V183/AP575	x	x	x	x	x	
V181/AP1333	x	x	x	x	x	

Ollae 7: Chronology

Place	1st half 1st BC	2nd half 1st BC	1st half 1st AD	2nd half 1st AD	1st half 2nd AD	2nd half 2nd AD	3rd AD	4th AD	5th AD
Regio X – Venetia et Histria									
Aquileia			x	x	x				
Basaldella			x	x					
Castions di Strada		x	x	x					
Codroipo		x	x	x					
Joannis			x	x					
Lestizza		x	x	x					
Mereto di Tomba		x	x						
Mortegliano			x	x					
Pavia di Udine		x	x						
Pozzuolo del Friuli			x	x					
Rivignano	x	x	x	x					
San Daniele del Friuli				x					
Sedegliano		x	x	x					
Sevegliano			x	x					
Teor		x	x	x					
Udine			x	x					
Varmo			x	x					
Aurisina			x	x					
Muggia Vecchia			x	x					
Ronchi dei Legionari			x	x					
San Servolo			x	x					
Trieste		x	x	x					
Timavo			x	x					
Arzene, Loc. Pras di Sora			x						
Chions	x	x	x	x					
Concordia			x	x	x				
Portogruaro			x	x					
Moggio Udinese			x	x					
Raveo			x	x					
Verzegnis		x	x						
Zuglio			x	x					
Adria			x	x					
Fizine		x	x						

Padova			x						
Pula		x							
Sermin	x	x	x						
San Simone		x	x						

Place	1st half 1st BC	2nd half 1st BC	1st half 1st AD	2nd half 1st AD	1st half 2nd AD	2nd half 2nd AD	3rd AD	4th AD	5th AD
Regio X – Venetia et Histria									
Aquileia			x	x	x	x	x		
Camino al Tagliamento			x	x					
Castions di Strada		x	x	x					
Codroipo			x	x					
Joannis			x						
Medea				x					
Neblo borg			x	x	x	x			
Rivignano		x	x	x	x	x			
Sedegliano		x	x	x	x				
Talmassons					x	x	x	x	
Ronchi dei Legionari			x	x	x	x			
Sermin			x						
Trieste							x	x	
Villa di Villa			x	x					
Verzegnis		x	x						
Zuglio			x	x					
Calvatone			x	x	x	x			
Casaleone			x	x					
Cerea		x	x	x	x	x			
Chiunsano			x	x	x	x	x		
Costabissara				x	x	x	x		
Cremona			x	x	x	x	x	x	
Fizine			x	x	x	x			
Krvavici			x	x	x	x			
Ljubljana - *Emona*			x	x	x	x			
Loron			x	x	x	x			
Manerbio				x					
Montegrotto Terme			x	x	x	x	x		
Musile di Piave			x	x	x	x			
Noventa di Piave			x	x	x	x			
Padova			x	x	x	x	x	x	
Pula			x	x	x	x			
Rodengo Saiano							x	x	
Roncade, Ca' Tron				x	x				

Rovinj, Veštar bay				x	x				
Sambruson di Dolo	?	?	?	?	?	?	?	?	?
Spodnje Škofije			x	x	x	x	x		
Torcello			x	x	x	x	x		
Vicenza			x						
Villimpenta	?	?	?	?	?	?	?	?	?
Regio XI – Transpadana									
Almese				x	x	x	x		
Biella				x	x	x			
Caselette			x	x					
Cavagliano, Loc. Bellinzago			x	x	x	x			
Cavigliano				x	x	x			
Cerrione		x	x						
Cozzo Lomellina		x	x	x	x	x			
Garlasco					x	x	x		
Ivrea			x	x	x	x			
Lomello			x	x	x	x	x	x	
Mariano Comense					x	x			
Milano		x	x	x	x	x			
Parabiago				x					
Pavia							x	x	x
Susa				x	x	x	x		
Torino			x	x					
Vercelli			x	x	x	x			
Regio IX – Liguria									
Alba		x	x	x	x	x	x		
Albenga				x					
Albisola				x					
Alessandria		x	x						
Asti			x	x	x	x			
Bene Vagienna - *Augusta Begiennorum*			x	x	x	x	x		
Cairo Montenotte				x					
Caprauna		x	x	x	x	x			
Casteggio			x	x	x	x	x	x	
Diano Marina			x	x	x	x	x		
Erli			x	x	x	x			
Filattiera			x	x					
Isasco				x					
Mezzanego			x	x	x	x			
Monteu da Po		x	x	x	x	x			
Nice, Loc. Cimiez			x	x	x	x			

Noli				x	x	x			
Perti			x	x					
Pietra Ligure			x	x					
Poirino			x	x	x	x			
Pollenzo				x	x				
Quiliano				x	x	x	x		
Rivanazzaro	x	x							
Roccaforte Ligure				x					
Rocchetta Palafea				x					
Sanremo			x	x	x	x	x		
Tortona			x	x	x	x	x		
Vado Ligure		x	x	x	x				
Val Ponci				x					
Ventimiglia – *Albintimilium*				x	x	x	x		
Regio VII – Etruria									
Luni - *Luna*			x	x	x	x	x	x	
Regio VIII – Aemilia									
Bondeno			x	x	x	x	x	x	
Budrio			x	x					
Cassana			x	x					
Faenza			x	x	x	x			
Fossa di Concordia			x	x	x	x	x	x	
Gonzaga		x	x	x					
Massa Finalese			x	x					
Modena			x	x	x	x			
Mortizzuolo			x	x					
Pegognaga		x	x	x	x	x	x	x	
Poviglio			x	x					
Russi			x	x	x				
San Basilio di Ariano	?	?	?	?	?	?	?	?	?
San Benedetto Po	x	x	x	x	x	x			
San Giovanni Ostel.			x	x					
Schivenoglia			x	x					
Serravalle a Po	?	?	?	?	?	?	?	?	?
Sustinente	?	?	?	?	?	?	?	?	?
Tesa della Mirandola			x	x	x	x	x		
Voghenza			x	x	x	x	x		
Regio V - Picenum									
Fermo			x	x	x	x			
Porto Recanati				x	x	x			
Out of Italy									

Baška			x	x	x	x			
Caraglio			x	x	x	x			
Ivoševci - *Burnum*					x	x			
Nin			x	x	x	x			
Omisalj			x	x	x	x			
Senj			x	x	x	x			
Vid - *Narona*			x	x	x	x			

Stella 1 coarse ware: Chronology

Stella 1 coarse ware	3rd BC	2nd BC	1st BC	1st AD	2nd AD	3rd AD	4th AD	5th AD	6th AD	7th AD	8th AD
Ollae 1											
V1/AP682+ AP732+ AP810+ AP917				x	x						
V2/AP234+ AP461+ AP508				x	x						
V3/AP47+ AP48+AP174 +AP259+ AP320				x	x						
V4/AP433+ AP572				x	x						
V5/AP858				x	x						
V6/ AP141+ AP249+ AP332+ AP740+ AP805				x	x						
V7/AP868+ AP984+ AP1042+ AP1184+ AP1335				x	x						
V8/AP142				x	x						
V9/AP156+ AP335+ AP770				x	x						
V10/AP689				x	x						
V11/AP886				x	x						
V12/AP978+ AP1054+ AP1153				x	x						
V13/AP696				x	x						
V14/AP169+ AP175+ AP525+ AP576				x	x						
V15/AP1380				x	x						

V16/AP889+ AP974				x	x						
V17/AP694+ AP750+ AP1143				x	x						
V18/AP1102				x	x						
V19/AP1031				x	x						
V20/AP625				x	x						
V21/AP533				x	x						
V22/AP937				x	x						
V23/AP1367				x	x						
V24/AP900				x	x						
V25/AP1223				x	x						
V26/AP85+ AP192+ AP532				x	x						
V27/AP211				x	x						
V28/AP912				x	x						
V29/AP692				x	x						
V30/AP741+ AP787				x	x						
V31/AP994+ AP1003+ AP1050				x	x						
V32/AP276+ AP423+ AP476				x	x						
V33/AP311+ AP631+ AP1245				x	x						
V34/AP20+ AP152+ AP483				x	x						
V35/AP212				x	x						
V36/AP243				x	x						
V37/AP999+ AP1076				x	x						
V38/AP749				x	x						
V39/AP399				x	x						
V40/AP92				x	x						
V41/AP1088				x	x						
V42/AP147				x	x						
V43/AP336				x	x						
V44/AP1019				x	x						

V45/AP923				x	x						
V46/AP1231				x	x						
V47/AP502				x	x						
V48/AP837				x	x						
V49/AP736				x	x						
V50/AP849+ AP1058				x	x						
V51/AP206				x	x						
V52/AP894+ AP990+ AP1014+ AP1057+ AP1082				x	x						
V53/AP206				x	x						
V112/AP1048				x	x						
V315/AP8				x	x						
Ollae 2											
V53/AP1186+ AP1239				x							
V54/AP1687				x							
V55/AP779				x							
V56/AP1649				x							
V57/AP695				x							
V58/AP950				x							
V59/AP1121				x							
V60/AP19				x							
V61/AP1490				x							
V62/AP1140				x							
V63/AP345				x							
V64/AP1355				x							
V65/AP1587				x							
V66/AP299				x							
V67/AP716+ AP854+ AP891				x							
V68/AP879				x							
V69/AP1456				x							
V182/AP1383				x							
V317/AP362				x							
V318/AP865				x							
V321/AP1377				x							
V322/AP1212				x							
V70/AP271+ AP1261+				x							

AP1304											
V71/AP295+ AP686+ AP981+ AP1690				x							
V72/AP780				x							
V73/AP724				x							
V74/AP381				x							
V75/AP1691				x							
V76/AP1073				x							
V77/AP43				x							
V78/AP1689				x							
V79/AP351+ AP836+ AP1095+ AP1295+ AP1302				x							
V80/AP165+ AP644+ AP715+ AP772				x							
V81/AP895+ AP942+ AP972+ AP975+ AP1041+ AP1108				x							
V82/AP733				x							
V157/AP99+ AP386				x							
V83/AP126				x							
V84/AP34+ AP131+ AP1699				x							
V85/AP6				x							
V86/AP1608				x							
V87/AP18				x							
V88/AP439				x							
V89/AP684				x							
V90/AP559				x							
V91/AP1145				x							
V92/AP1146				x							
V93/AP557				x							
V94/AP966				x							

V95/AP1188				x							
V96/AP1117				x							
V97/AP280				x							
V98/AP1244				x							
V99/AP756				x							
V100/AP1693				x							
V101/AP1147				x							
V102/AP523				x							
V103/AP154				x							
V104/AP1372				x							
V105/AP517				x							
V106/AP245+ AP712				x							
V107/AP96+ AP104+ AP382				x							
V108/AP172				x							
V109/AP1562				x							
V110/AP17+ AP626				x							
V111/AP885+ AP938				x							
V113/AP457				x							
V114/AP1287				x							
V115/AP738				x							
V116/AP489				x							
V117/AP851				x							
V118/AP1256				x							
V119/AP478				x							
V120/AP1357				x							
V121/AP552				x							
V122/AP56				x							
V123/AP1386				x							
V124/AP9830				x							
V125/AP916				x							
V126/AP637				x							
V319/AP615				x							
Ollae 3											
V147/AP973+ AP1030			x	x							
V127/AP1636 +AP1646			x	x							
V138/AP1625			x	x							
V150/AP 519			x	x							

V156/AP400			x	x							
V168/AP987			x	x							
V 128/ AP 1697					x	x	x	x	x	x	
V144/AP 4									x	x	
V129 /AP13									x	x	
V158/AP718+ AP826									x	x	
V137/AP 982				x	x	x	x	x	x		
V155/AP599			x	x	x	x	x	x	x		
V135/AP1294							x				
V142/AP1230							x	x	x		
V162/AP1431								x	x	x	x
V132/AP215							x	x	x	x	x
V133/AP363							x	x	x	x	x
V141/AP401							x	x	x	x	x
V145/AP342							x	x	x	x	x
V151/AP778							x	x	x	x	x
V164/AP1632							x	x	x	x	x
V160/AP1103							x	x	x	x	
V161/AP287							x	x	x	x	
V163/AP222											
V159/AP455+ AP482+ AP560			x	x							
V166/AP1388 +AP1391+ AP1403							x	x	x	x	
V165/AP1464							x	x	x	x	
V167/AP757							x	x	x	x	
Ollae 4											
V174/AP1489			x								
V170/AP1623			x								
V171/AP1260			x								
V148/AP709				x	x	x	x				
V172/AP1668				x	x	x	x				
V218/AP169	x	x	x	x							
V176/AP1634	x	x	x	x							
V175/AP297	x	x									
Ollae 5											
V177/AP827+ AP877+ AP986+ AP989+			x	x							

AP1694											
V178/AP460						x	x				
V179/AP753						x	x	x	x	x	
Ollae 6											
V180/AP846			x	x							
V181/AP1333			x	x	x						
V183/AP575			x	x							
V184/AP278			x	x							
Ollae 7											
V185/AP1225				x							
V186/AP1385				x							
V187/AP884				x							
V188/AP1209 +AP1484				x							
V189/AP1499				x							
V190/AP1278				x							
Ollae 8											
V191/AP213				x	x						
V193/AP16				x	x						
V195/AP1412				x	x						
V196/AP1539				x	x						
V201/AP742+ AP834				x	x						
V202/AP1327				x	x						
V203/AP824				x	x						
V204/AP146				x	x						
V205/AP791				x	x						
V207/AP944				x	x						
V212/AP474+ AP521				x	x						
V192/AP699				x	x						
V194/AP394				x	x						
V197/AP67+ AP124+AP69				x	x						
V198/AP134				x	x						
V199/AP224				x	x						
V200/AP574				x	x						
V206/AP393+ AP766				x	x						
V208/AP2				x	x						
V209/AP395				x	x						
V210/AP7+ AP60				x	x						

V211/AP726+ AP888+ AP1692				x	x						
Auerberg productions											
V213/AP196				x							
V223/AP820+ AP821+ AP825				x							
V225/AP28+ AP198				x							
Ollae 10											
V214/AP281							x	x			
V215/AP711									x		
Beakers											
V226/AP601				x	x						
Pans											
V245/AP1495				x							
V246/AP440			x	x							
V247/AP951				x							
V248/AP1331				x							
Bowls											
V250/AP658				x	x	x	x				
V251/AP577				x	x	x	x				
Platter											
V249/AP269+ AP273+ AP410+ AP1311				x							
Varia											
V252/AP442+ AP454+ AP494+ AP542+ AP573				x	x						
V259/ AP648+ AP786				x	x	x	x	x	x		
Stamped base											
V314/AP1531 +AP1589+ AP1596		x	x	x							

Appendix IV.
Plates

PLATE I

1

2

3

4

1. V2/AP234+AP461+AP508 **2.** V3/AP47+AP48+AP174+AP259+AP320
3. V6/AP141+ AP249+ AP332+ AP740+ AP805 **4.** V17/AP694+AP750+AP1143

PLATE II

5

6

7

8

5. V31/AP994+AP1003+AP1050 **6.** V32/AP276+AP423+AP476
7. V34/AP20+AP152+AP483 **8.** V315/AP8

PLATE III

9

10

11

9. V50/AP849+AP1058 **10.** V67/AP716+AP854+AP891 **11.** V68/AP879

PLATE IV

12

13

14

12. V82/AP733 **13.** V80/P165+AP644+AP715+AP772 **14.** V83/AP126

PLATE V

15

16

17

18

19

15. V147/AP973+AP1030 **16.** V162/AP1431 **17.** V159/AP455+AP482+AP560
18. V178/AP460 **19.** V184/AP278

PLATE VI

20

21

22

23

20. V187/AP884 **21.** V194/AP394 **22.** V197/AP67+AP124+AP69
23. V195/AP1412

PLATE VII

24

25

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27

24. V201/AP742+AP834 **25.** V212/AP474+AP521
26. V213/AP196 **27.** V223/AP820+AP821+AP825

PLATE VIII

28

29

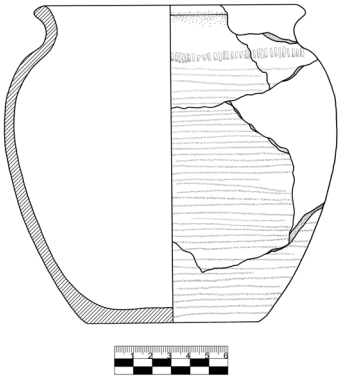
30

28. V252/AP442+AP454+AP494+AP542+AP573
29. V259/AP648+AP786 **30.** V260/AP26+AP83

PLATE I

Ollae 1

Ollae Ia



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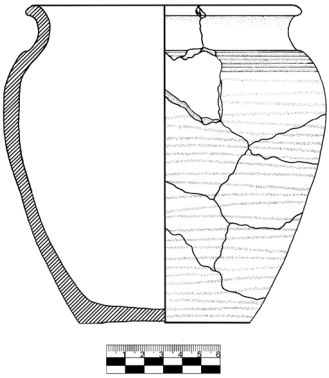

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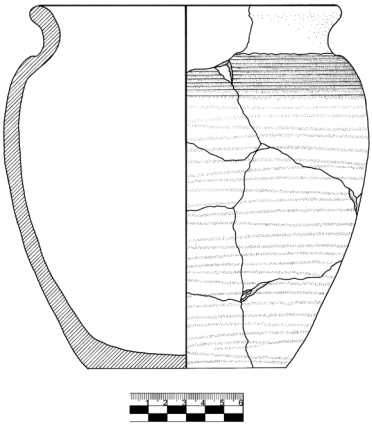

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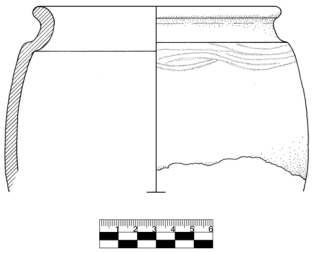

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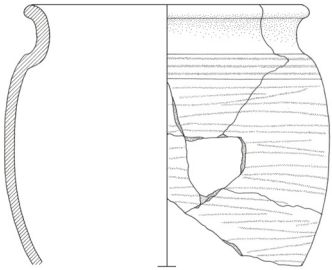
Scale 1:4

1. V1/AP682+AP732+AP810+AP917 **2.** V2/AP234+AP461+AP508
3. V3/AP47+AP48+AP174+AP259+AP320 **4.** V6/AP141+ AP249+ AP332+ AP740+ AP805

PLATE II



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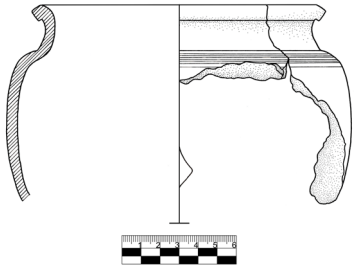

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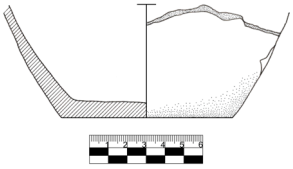

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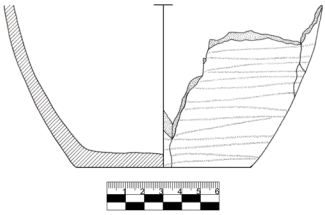

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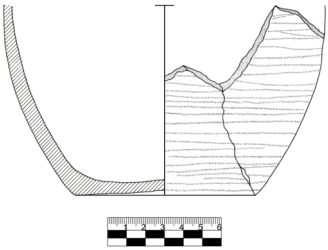

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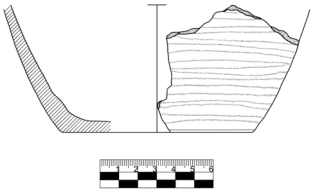

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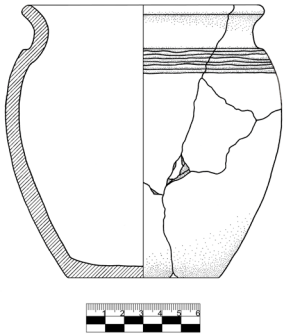
Scale 1:4

5. V7/AP868+AP984+AP1042+AP1184+AP1335 **6.** V30/AP741+AP787
7. V16/AP889+AP974 **8.** V17/AP694+AP750+AP1143
9. V24/AP900 **10.** V25/AP1223

PLATE III

Ollae Ib



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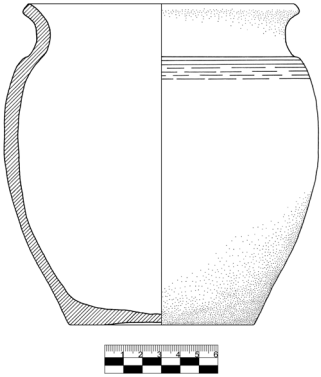

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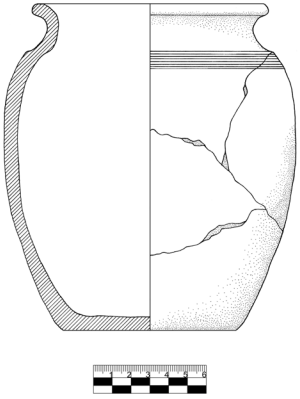

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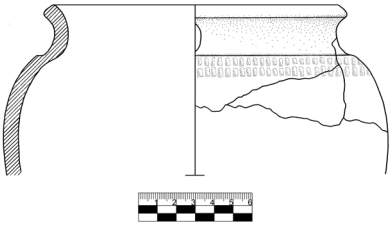

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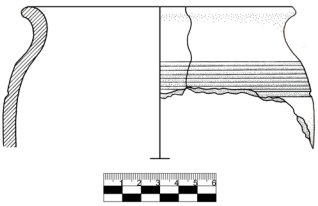
Scale 1:4

11. V31/AP994+AP1003+AP1050 **12.** V32/AP276+AP423+AP476
13. V33/AP311+AP631+AP1245 **14.** V34/AP20+AP152+AP483

PLATE IV



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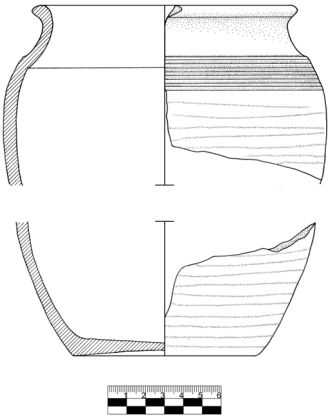

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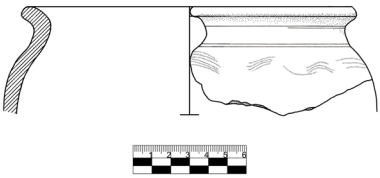

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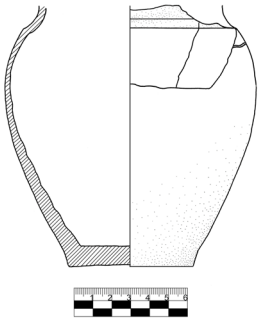
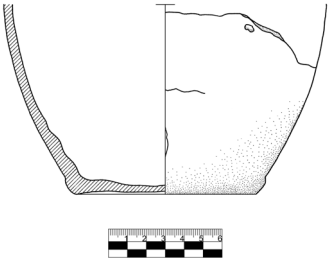


18

Scale 1:4

15. V37/AP999+AP1076 **16.** V41/AP1088
17. V46/AP1231 **18.** V315/AP8

PLATE V



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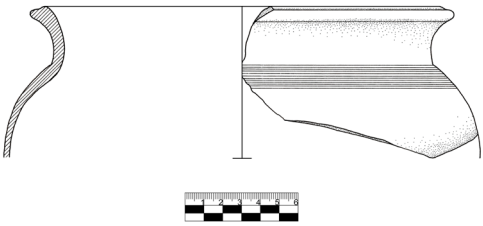
Ollae Ic



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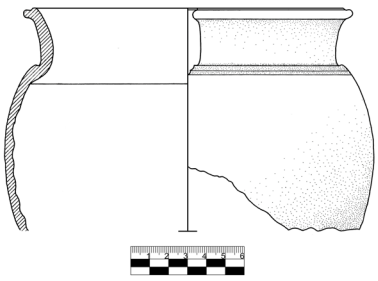

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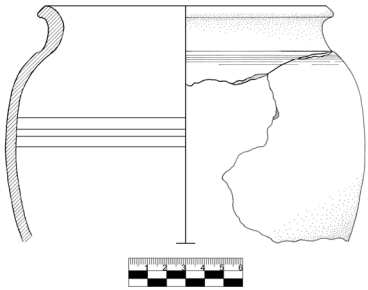


22

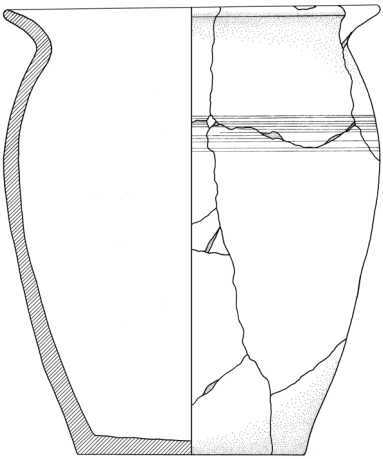
Scale 1:4

19. V112/AP1048 **20.** V50/AP849+AP1058 **21.** V51/AP206
22. V52/AP894+AP990+AP1014+AP1057+AP1082

PLATE VI

Ollae 2

Ollae 2a



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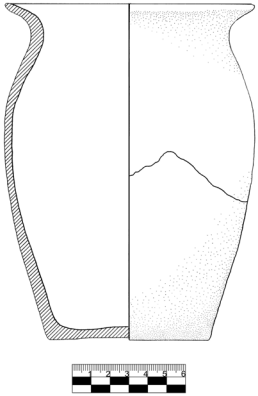

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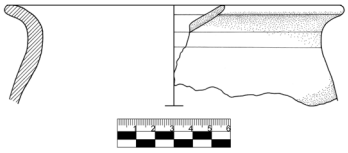

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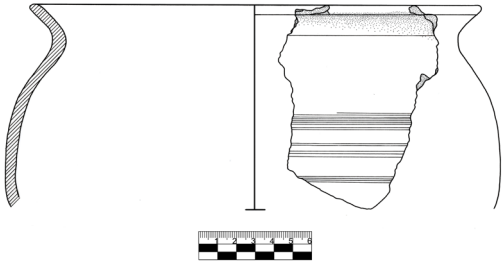


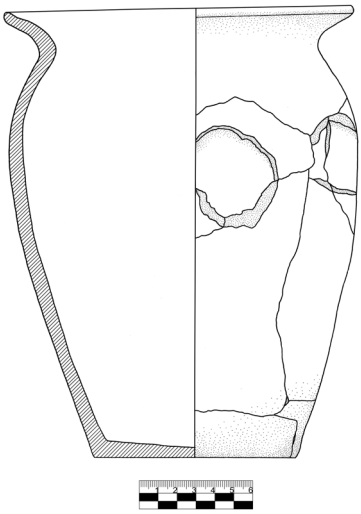
26

Scale 1:4

23. V67/AP716+AP854+AP891 **24.** V68/AP879
25. V321/AP1377 **26.** V322/AP1212

PLATE VII

Ollae 2b



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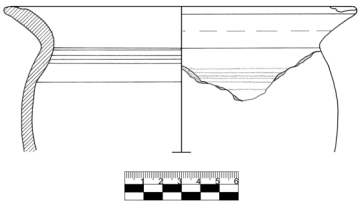

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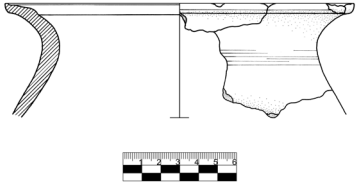

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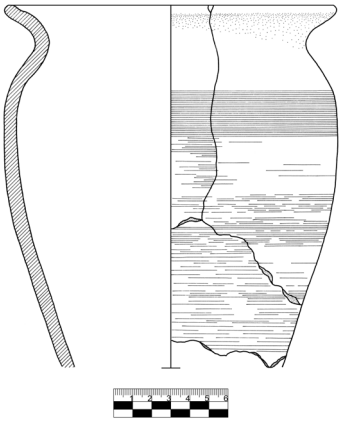

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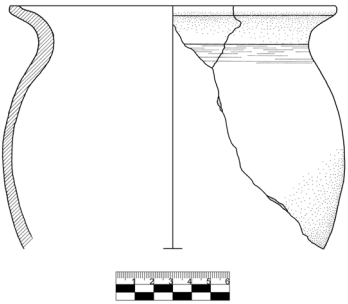
Scale 1:4

27. V82/AP733 **28.** V70/AP271+AP1261+AP1304
29. V71/AP295+AP686+AP981+AP1690 **30.** V80/AP165+AP644+AP715+AP772

PLATE VIII



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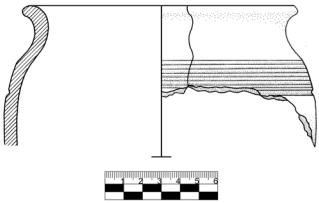

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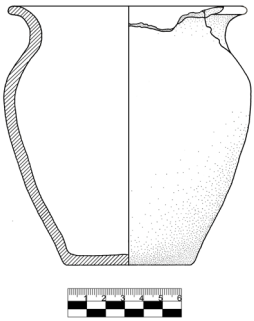
Ollae 2c



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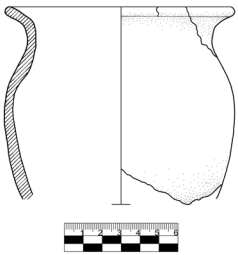


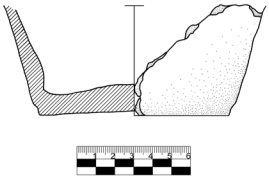
34

Scale 1:4

31. V81/AP895+AP942+AP972+AP975+AP1041+AP1108 **32.** V157/AP99+AP386
33. V83/AP126 **34.** V84/AP34+AP131+AP1699

PLATE IX

Ollae 2; generic fragments



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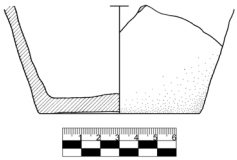

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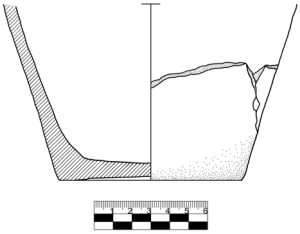

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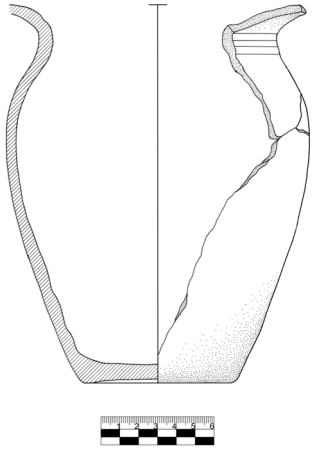


38

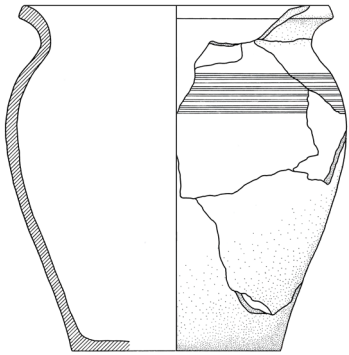
Scale 1:4

35. V106/AP245+AP712 **36.** V108/AP172
37. V111/AP885+AP938 **38.** V113/AP457

PLATE X

Ollae 3

Ollae 3a



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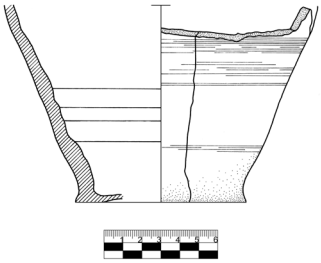

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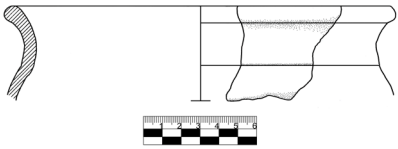

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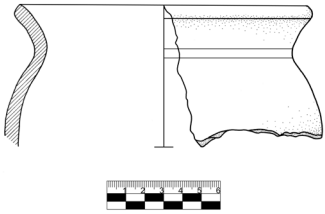
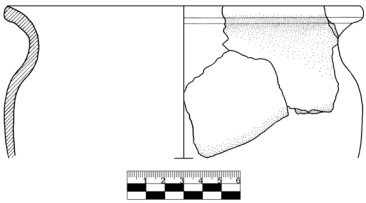


42

Scale 1:4

39. V147/AP973+AP1030 **40.** V168/AP987
41. V128/AP1697 **42.** V144/AP4

PLATE XI



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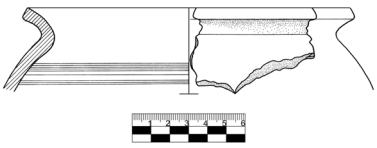
Ollae 3b



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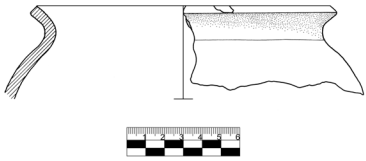

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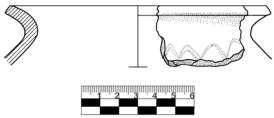


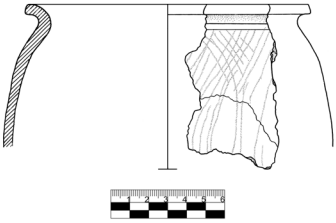
46

Scale 1:4

43. V137/AP982 **44.** V135/AP1294
45. V142/AP1230 **46.** V162/AP1431

PLATE XII

Ollae 3c



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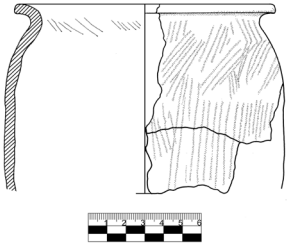
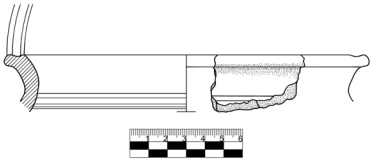


48

49

Ollae 3d



50

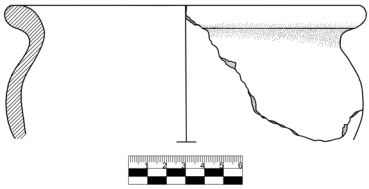
Scale 1:4

47. V160/AP1103 **48.** V161/AP287
49. V159/AP455+AP482+AP560 **50.** V166/AP1388+AP1391+AP1403

PLATE XIII

Ollae 4

Ollae 4a



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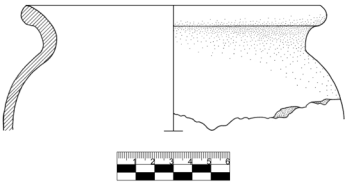
Ollae 4b



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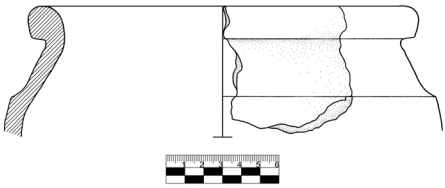
Ollae 4c



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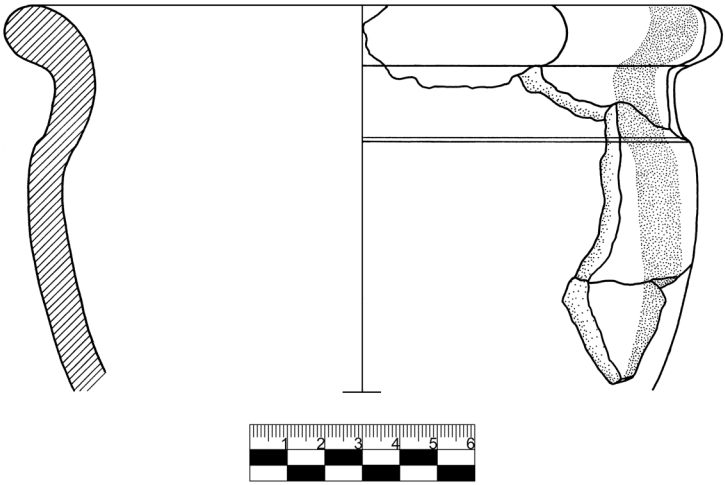
Scale 1:4

51. V174/AP1489 **52.** V148/AP709
53. V169/AP218

PLATE XIV

Ollae 4d



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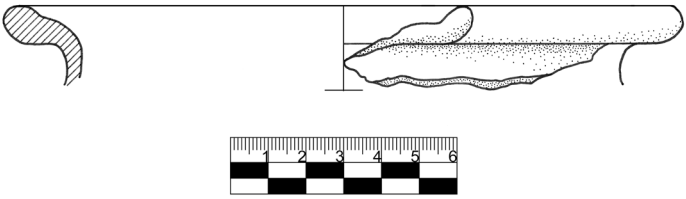
Ollae 4e



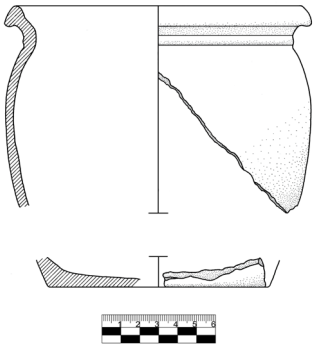
55

Scale 1:2

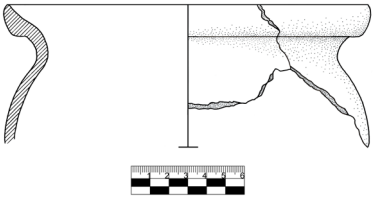
54. V175/AP297 **55.** V173/AP263

PLATE XV

Ollae 5



56



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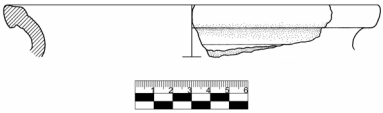


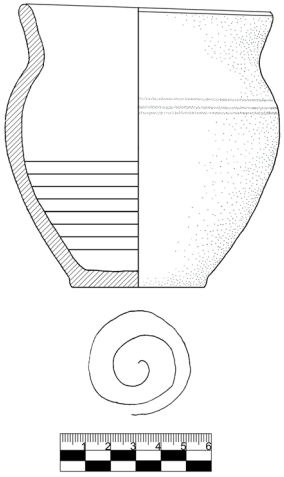
58

Scale 1:4

56. V177/AP827+AP877+AP986+AP989+AP1694
57. V178/AP460 **58.** V179/AP753

PLATE XVI

Ollae 6



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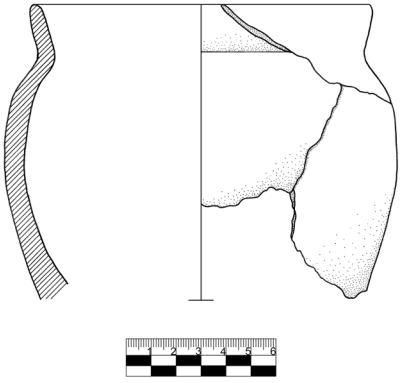


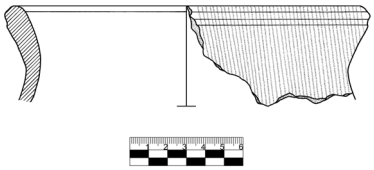
60

Scale 1:3

59. V184/AP278 **60.** V183/AP575

PLATE XVII

Ollae 7



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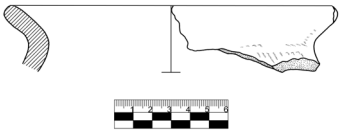

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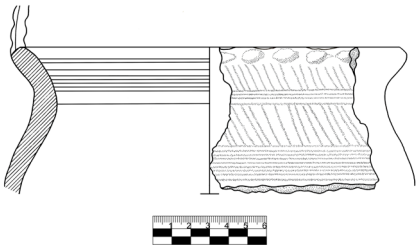

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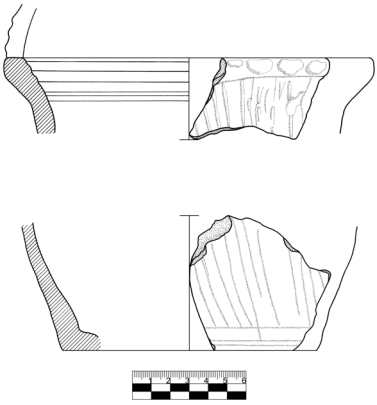

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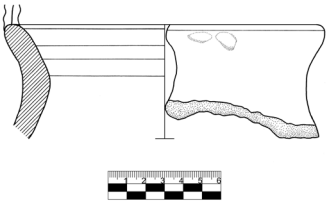


65

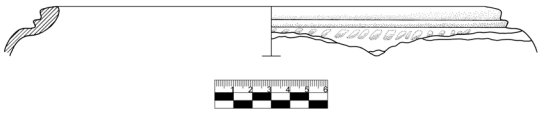
Scale 1:4

61. V185/AP1225 **62.** V186/AP1385 **63.** V187/AP884
64. V188/AP1209+AP1484 **65.** V190/AP1278

PLATE XVIII

Ollae 8

Ollae 8a



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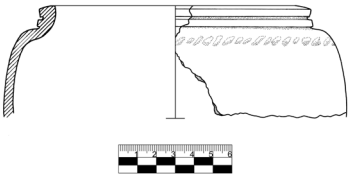

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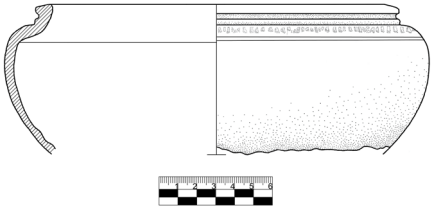

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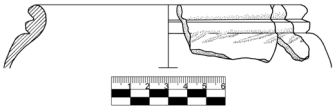

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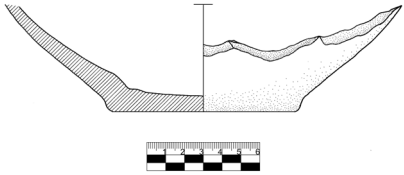


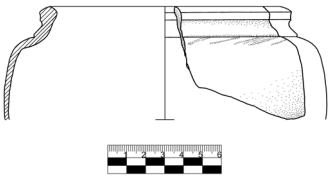
70

Scale 1:4

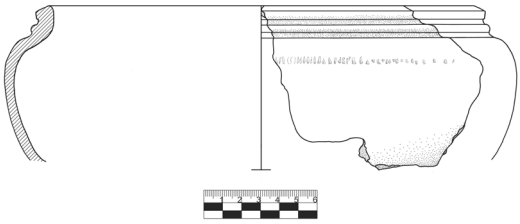
66. V192/AP699 **67.** V194/AP394 **68.** V197/AP67+AP124+AP69
69. V206/AP393+AP766 **70.** V211/AP726+AP888+AP1692

PLATE XIX

Ollae 8b



71



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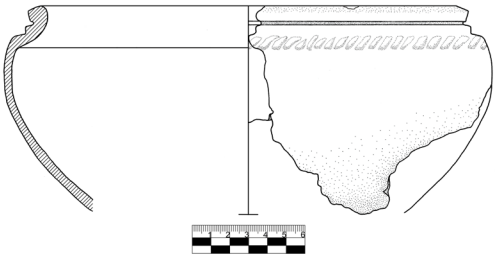
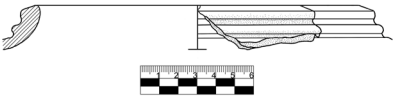


73

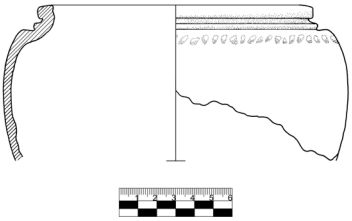
Scale 1:4

71. V191/AP213 **72.** V195/AP1412
73. V201/AP742+AP834

PLATE XX

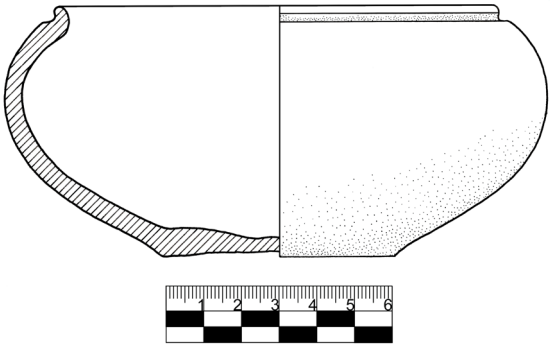


74



75

Scale 1:4



76

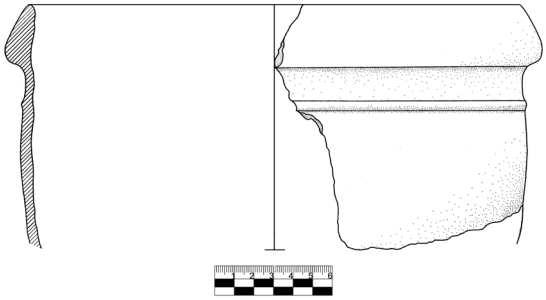
Scale 1:2

74. V202/AP1327 **75.** V205/AP791
76. V212/AP474+AP521

PLATE XXI

Ollae 9

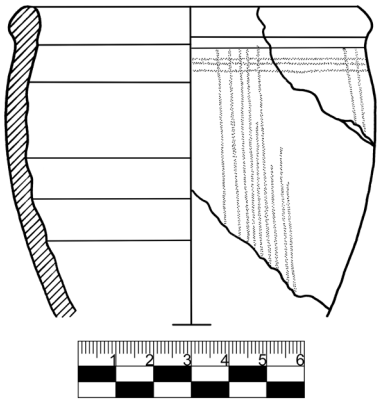
Ollae



77

Scale 1:4

Beakers



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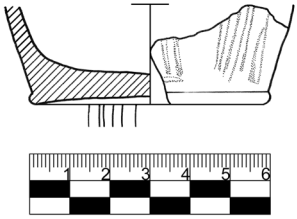


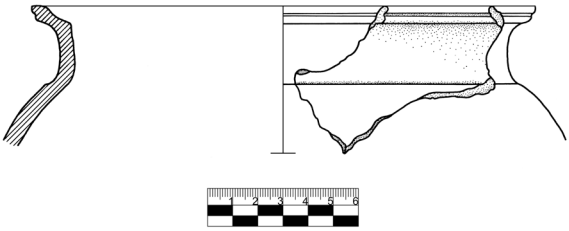
79

Scale 1:2

77. V213/AP196 **78.** V223/AP820+AP821+AP825
79. V225/AP28+AP1698

PLATE XXII

Ollae 10



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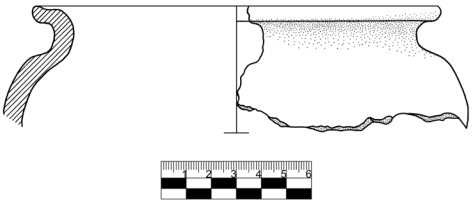


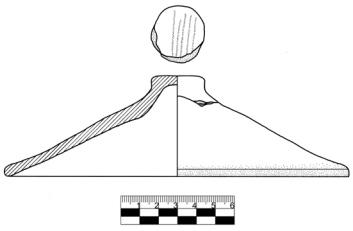
81

Scale 1:3

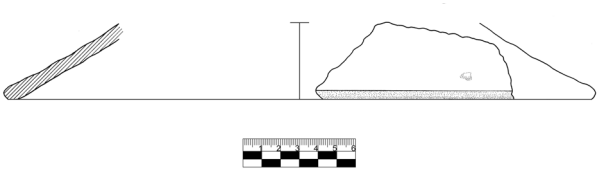
80. V214/AP281 **81.** V215/AP711

PLATE XXIII

Lids 1

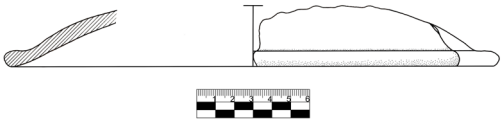


82

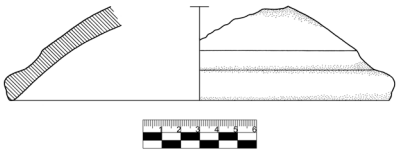


83

Lids 2



84



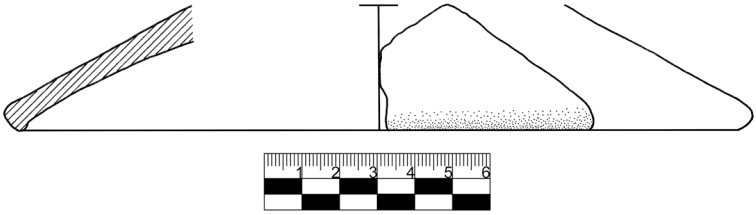
85

Scale 1:4

82. V234/AP480+AP596 **83.** V233/AP1381
84. V235/AP1330 **85.** V239/AP1588

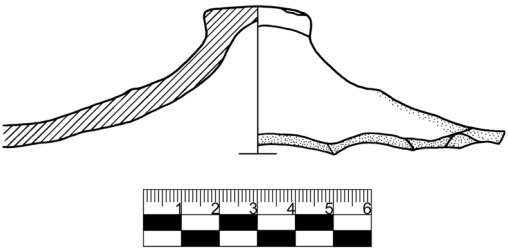
PLATE XXIV

Lids 3



86

Lids knobs



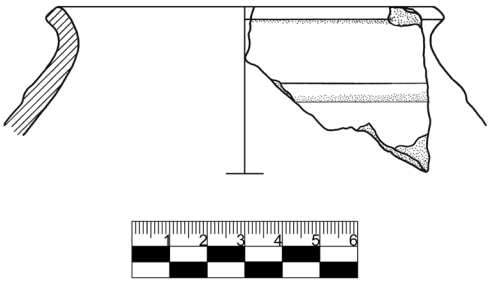
87

Scale 1:2

86. V240/AP1389 **87.** V244/AP1274

PLATE XXV

Beakers



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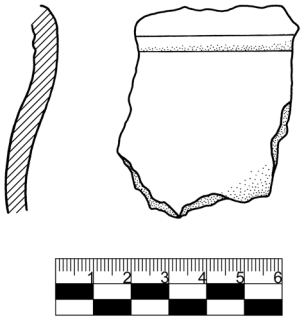
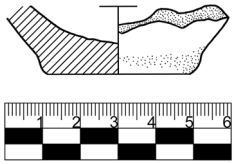


89



90

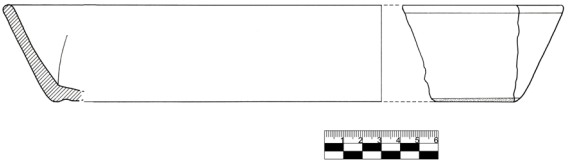
Scale 1:2

88. V227/AP1491 **89.** V226/AP601
90. V230/AP1269+AP1374

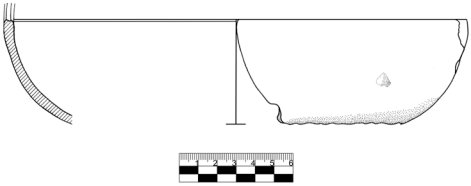
PLATE XXVI

Pans

91



92



93

Scale 1:4

91. V246/AP440 **92.** V245/AP1495
93. V248/AP1331

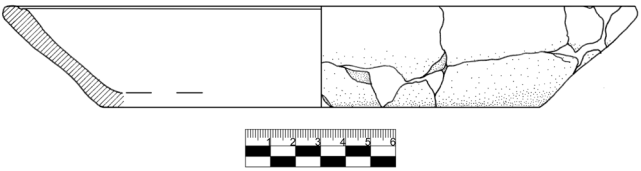
PLATE XXVII

Bowl

94

Scale 1:4

Platter



95

Scale 1:3

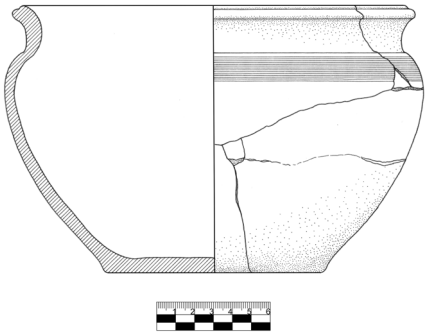
94. V251/AP577
95. V249/AP269+AP273+AP410+AP1311

PLATE XXVIII

Varia

96

Scale 1:3



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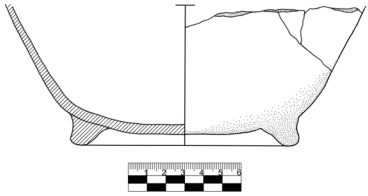
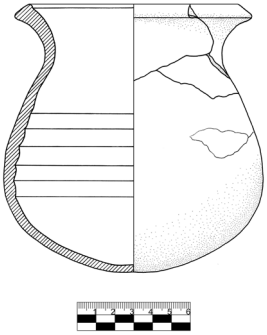


98



99

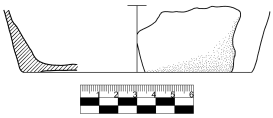
Scale 1:4

96. V257/AP1478 **97.** V252/AP442+AP454+AP494+AP542+AP573
98. V259/AP648+AP786 **99.** V260/AP26+AP83

PLATE XXIX

Bases

Bases 1



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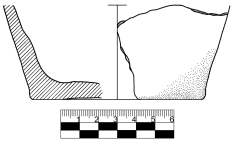
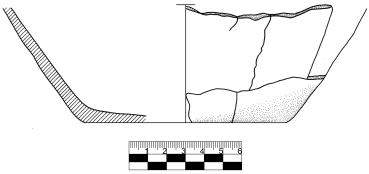
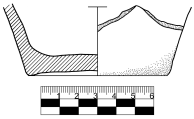


101

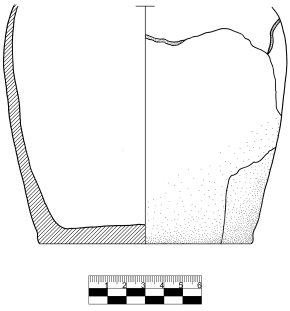


102



103

Bases 2



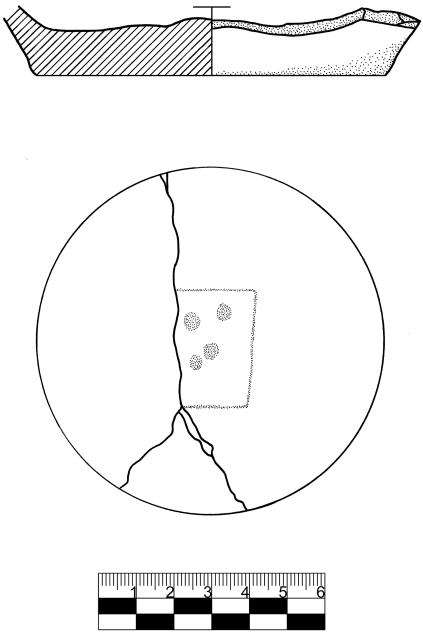
104

Scale 1:4

100. V265/AP1228 **101.** V268/AP1205 **102.** V273/AP1455
103. V279/AP1305 **104.** V316/AP239

PLATE XXX

Stamped base



105

Scale 1:2

105. V314/AP1531+AP1589+AP1596