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A Database for Qalʿa-ye Tepe (Sistan, Iran): Preliminary Analysis of the Pottery

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Abstract

The aim of this article is to review, organize and digitize a number of data from the 1961-1962 Italian Archaeological Mission directed by Umberto Scerrato in Qalʿa-ye Tepe (Sistan, Iran): four handwritten notebooks with some small but significant unedited details about the excavation and the existing database of the pottery. The study focused both on the improvement of the database creating a digital instrument capable to facilitate the quantitative, qualitative, and chronological analysis on the pottery and a preliminary study on a limited amount of pottery fragments now located between Rome and Naples. The re-organized database made it possible to obtain new results integrating the existing knowledge on the site and the pottery assemblage with the re-analyzed data enhancing the understanding of Qalʿa-ye Tepe and its historical context.

Keywords: Pottery; Database; Iran, Parthian, Sasanian

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Introduction

The site of Qalʿa-ye Tepe has been part of a huge research program in Sistan, directed by Giuseppe Tucci and promoted by ISMEO. [1] This article, as well as others in course of publication or presentations (Genito 2021; 2022; in printing), is part of the project named "Historical Sistan" of the *Università degli Studi di Napoli "L'Orientale"* and ISMEO (Roma), directed by Bruno Genito. The project, to which different scholars, PhD and MA students have collaborated over the last years, aims at editing all the data and information left unpublished by Umberto Scerrato in the shortest possible time, and at comparing them with the updated archaeological activities carried out in the meantime in Sistan and in the surrounding areas by the Iranian colleagues. The Italian Archaeological Mission in Sistan (Iran) focused on Qalʿa-ye Tepe between 1961 and 1962. The excavation was directed by Umberto Scerrato, with the assistance of G. Graziani and E. Frascarolo, the drawer, and the collaboration of Mr. Kangewi, officer of the General Service of Antiquites of Iran.

The aim of this article is to review, organize and digitize a number of data from the '60s excavation, trying to understand and digitize four old handwritten notebooks with some small but significant unedited details about the excavation and re-organize the database of the pottery, originally set up by dr. Ivana Amalia Olimpo.

It was necessary to collect all the data concerning the pottery fragments, including photos and drawings, in a digital tool capable to manage and cross information to facilitate the archaeological interpretation. Unfortunately, it was not possible to take in account all the pottery fragments collected from the excavation because they are kept in Zahedan; the work carried out is proposed, thus, as a

[1] I would like to deeply thank Prof. B. Genito and ISMEO for giving me the opportunity to work on Qalʿa-ye Tepe documentation, making possible this article; I would also like to thank dr. G. Maresca, dr. M. Rugiadi and dr. I. A. Olimpo who collected part of the data about the 188 pottery fragments included into the newly created database, without whose work it would have been not possible to attempt to a re-organization and re-interpretation of the data.

preliminary analysis of a small group of fragments located in Rome and Napoli about which it was possible to recover the most information. It was possible, using the database, to attempt a quantitative, qualitative and chronological analysis, trying to link the data emerged from the pottery to what was already known on the archaeological aspects of the site, along with what was possible to add to the information about the excavation.

The site of Qal'a-ye Tepe

Qalʿa-ye Tepe lies in Sistan and Baluchestan, the second largest province of the 31 provinces of Iran, bordering to the North with the Southern Khorasan region and Afghanistan, to the South with the Gulf of Oman, to the East with Afghanistan and Pakistan, to the West with the province of Kerman and to the Southwest with that of Hormozgan. In particular, the site is located about 20km North-East from Zabol and about 200km from Zahedan, not far from the ancient Zaranj of Islamic period (Figs. 1-2) (Genito 2022, pp.1-3).

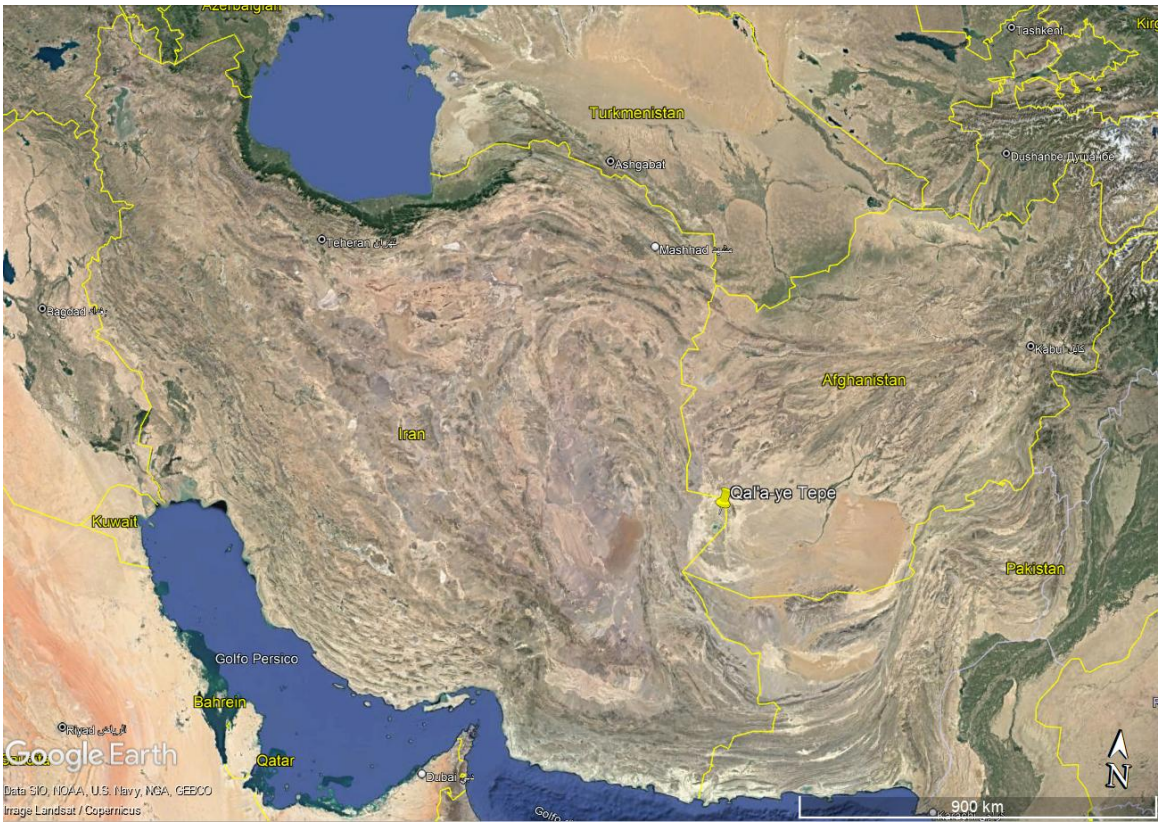

Fig. 1 - Localization of Qalʿa-ye Tepe from Google Earth 2023

Fig. 2 - Localization of Qalʿa-ye Tepe from Google Earth 2021

Fig. 3 - The site of Qalʿa-ye Tepe from Google

Qalʿa-ye tepe is described as a fortified settlement based on a low ellipsoidal hill which rises about 12m above the desert plain, covering an area of 160×130m with the major axis running East-West. Apparently, the hill seems to be artificial; generally, ruins in Sistan lies on natural hills moulded by the wind (Figs. 3-4).

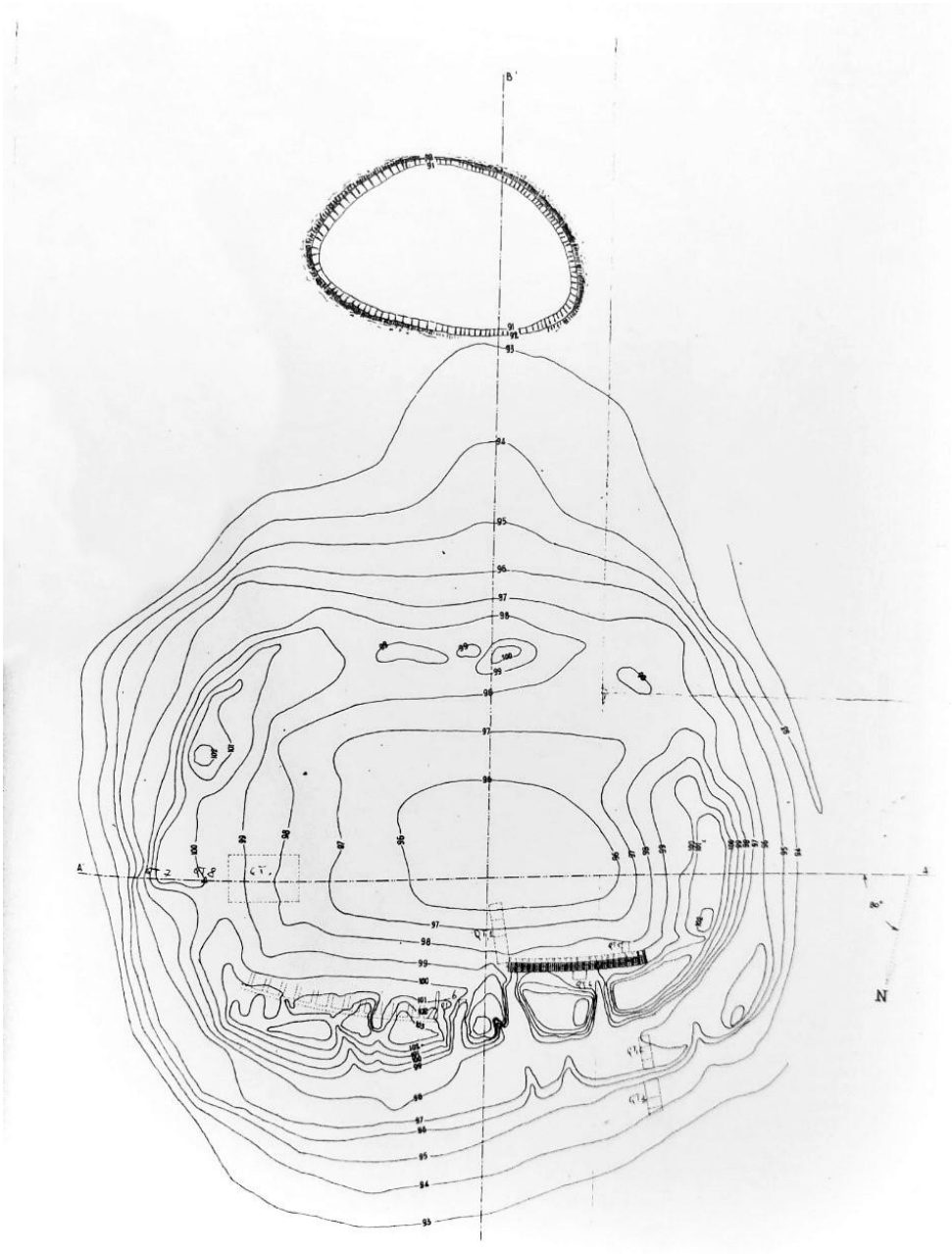

Fig. 4 - Plan of the site

After a preliminary survey, already discussed, 12 trenches were opened: the main trench denominated QT (Qalʿa-ye Tepe) and 11 more trenches defined with the acronym QT followed by progressive numbers from 1 to 11. The excavation permitted to recognize three principal periods and various sub-phases.

In a sketch contained one of the handwritten notebooks, it was found a plausible representation of the main trench QT, which appears to be divided as it follows; six almost square sectors, which are identified with progressive numbers from 1 to 6 plus letters A and B, referring to the positioning of the sector (B for sectors laying South, A for sectors laying North) (Fig. 5).

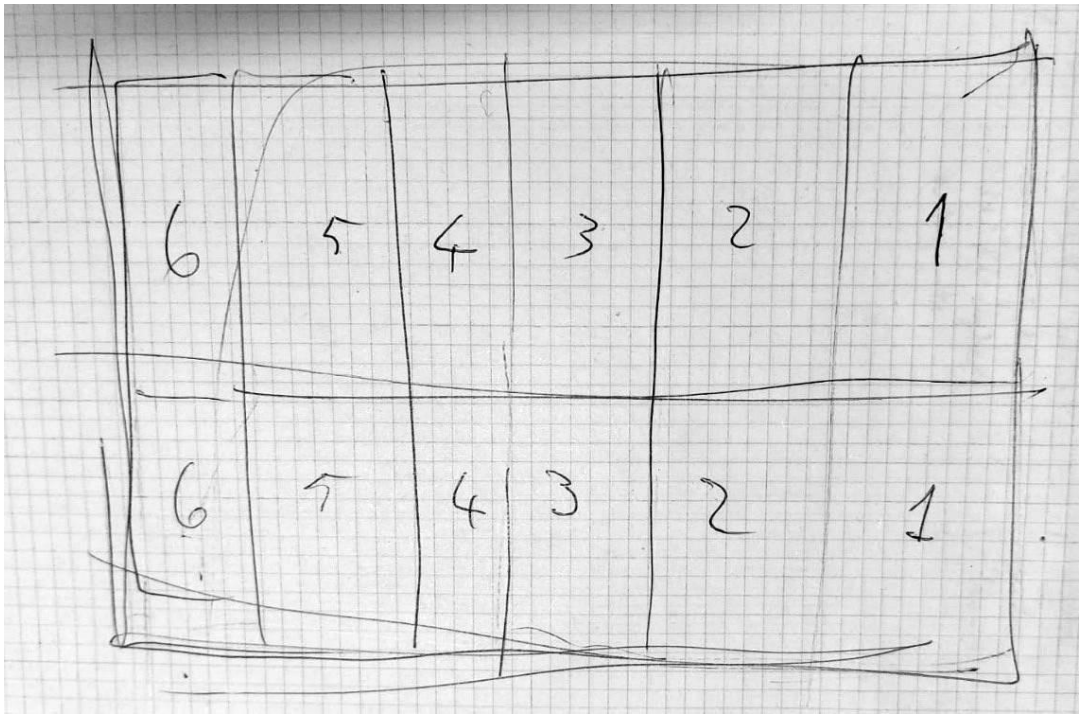

Fig. 5 - Original sketch from Scerrato notebook, depicting the partition of the main trench QT

The investigation allowed to detect that the tepe was defended by a double enclosure which surrounds a sub-circular space. One external enclosure, more damaged, of Islamic period (period III) which consist of two curtains of mud bricks (5×38/39cm) with a kind of circular mark, filled with flakes of result. The investigation of the wall through trenches QT2 and QT3 allowed also to intercept traces of burnt; one innermost enclosure dating back to parthian-sasanian era (period II). The second enclosure, 10m thick, is almost preserved for the entire perimeter of the settlement. It is made by uneven soil strata, coated by mud bricks (5/6×31/32cm) in correspondence with the North-eastern corner's external façade and the North-western corner's internal façade.

At least 11 vaulted rooms, opened toward the inside of the wall, served as crowning of the enclosure. Foundations are in *paxa* blocks (30×30×9cm), while walls and vault are made of oblong grey mud bricks (35×21×6/6.8cm). These rooms date back to a phase between I and II, during which they were reused.

The great internal enclosure incorporates, as detected through the trench QT 4, an innermost and more ancient enclosure (period I) which is built in uneven mud blocks. This enclosure could date back to a hellenistic/early parthian period.

In the trench QT traces of a structure datable at period III were detected.

West of trench QT, trench QT1 was opened, measuring 10×2.5m. At least two phases were detected: phase I characterized by hard soil; phase II that extends toward the bottom for 40cm in height. The soil is hard, compact and damp, with few potsherds. Mud-bricks were detected (38-40×38-40×7cm, but also measuring 19×19×7cm). A possible wall built in bricks (48×48×6cm) was identified.[2]

Methods and problems

The aim of the current article, as already mentioned, is the digitization of the paper documentation and other collected information about the site and the archaeological materials from Qalʿa-ye Tepe.

[2] The description of the site is made after a synthesis of what reported by Scerrato (1970, pp. 123-142) and what was extracted from the handwritten notebooks left by him.

As said before, the archaeological material from Qalʿa-ye Tepe was stored in Rome (Italy) at *Museo d'Arte Orientale* and at *Centro Scavi IsIAO*. In 2007 it was temporarily moved to CISA (*Centro Interdipartimentale di Servizi di Archeolgia)*, at *Università "L'Orientale"*, after the responsibility of Prof. Bruno Genito (2022).

In this occasion, it was possible to understand the quantity and quality of the documentation, and also what kind of pottery materials were discovered and brought to Italy after the archaeological campaigns.

The documentation included two brief excavation reports written by Prof. U. Scerrato, plan and sections of the site, photos, at least 40 drawings of trench QT11 and four notebooks with notes and some sketches from the 1961's campaign digitised by the author.

A first attempt to realize a digital archive capable to store all the documentation obtained by the *Missione Archeologica Italiana* during the archaeological campaign in Sistan, consisted of the conception and partial realization of a WebGIS within the DI.AR.IN.S. and Archaeo.Pro.Di.Mu.S projects, respectively in 2003 and between 2013 and 2014, promoted by CISA and directed by Prof. Bruno Genito. A key moment toward the preparation of a data management system usable and functional as well, was the digitization of paper documentation regarding activities in Dahane-ye Gholaman, Kuh-e Khwaja, Qalʿa-ye Sam and Qalʿa-ye Tepe as well (Genito *et alii*, 2013, p. 187).

After the digitization of the documentation from the field activities, the second important phase of the work was the direct study of the archaeological findings, mainly pottery, aimed to not only the storage of crucial information about them, but at a re-examination of the materials to prepare a base for further studies. Archaeological materials included 1266 pottery fragments and other materials like metal artifacts, stone vessels' fragments, glasses and coins.

For the current work the author re-examined the already digitized material, to better understand the previous organization of the data and to proceed with a tidy re-organization of the pottery database, attempting a preliminary analysis on the few pottery fragments included in the database.

The first and biggest issue has always been the large time *iatus* between the excavation and the re-organization of the data collected on the field. As a standardized method for the archaeological documentation does not exist, the data organization is always hooked with thoughts and methods of archaeologists involved. To re-examinate old data means to face enormous difficulties in understanding terms and categories, mediating between respecting their essence and making them accessible for the scientific community and future scholars as well.

In this specific case, to re-read handwritten notebooks by Scerrato proved to be particularly tough. Despite the difficult of understanding Scerrato's handwriting, keeping in mind that the notebooks contain information and sketches taken on the field, the bigger issue was to understand the stratigraphic information. The data, in fact, were accompanied just by few sketches, depicting sections of some of the trenches excavated, a single schematic plan of the site and photos, which not included blackboard or any other information about what they depicted. Net of the difficulties, re-analyzing the notebooks, whose existence was already well known, allowed to detect excavation details never published before and useful for future confrontation.[3]

The Database

The built database was needed to organize and manage all the information we currently have about the 188 pottery fragments out the 1266 discussed above. For almost all the fragments selected it

[3] Information obtained from the notebooks are included in the description of the site above to improve the few data available from Scerrato reports.

was possible to regain crucial information like horizontal and vertical provenance, photos and drawings based on which other details like class, form, shape and decoration of the fragment were detected.

First of all, the operation has exploited the need to re-organize and to preserve an outdated and dispersive documentation. For this reason, the planning phase of the digital archive focused on the need to link textual data with graphic and photographic documentation. It was important to us to build a research database useful both to check and to seek information, and to be used as a tool capable to support the interpretative and analytical phases through the possibility to correlate different data and have a clear and unified image of all the produced documentation about the findings.

It has been decided to use Microsoft Excel. The database, containing 11 columns and 200 records, have all the information needed to identify the pottery fragment inventoried.

Using the data validation tool, it was possible to realize a small *controlled vocabulary*[4] that allowed us to standardize the filling of the fields, by restricting it to a default list of options. In case of manual compilation, the input of not provided data will be reported by an error window that will invalidate the operation. The list of terms selected to avoid redundancies and normalize the vocabulary, was realized taking in account the possibility to expand the database (Fig. 6).

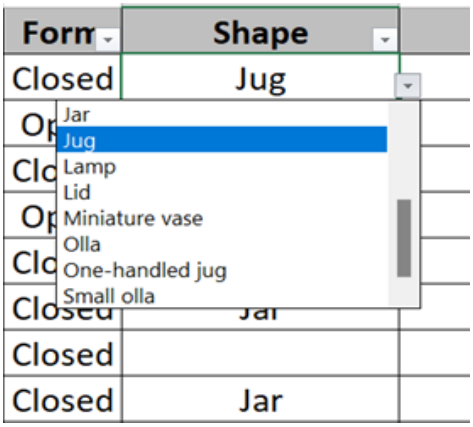

Fig. 6 - Example of the list of the predefined options available for the filling of the field

The arbitrariness of the inventory numbers, as well as the heterogeneity of the data contained within the spreadsheets and the limited textual information about horizontal and vertical provenance of the pottery, for certain, hinder the readability of the information. This issue has constituted and constitutes one of the main limitations of the database. Based on these considerations, it is important to point out that our archive does not, in fact, propose to overcome the private dimension of the information.

Main goal was and still is the preservation of a fragile and heterogeneous documentation, never or partially published before to help and facilitate further studies.

[4] A *controlled vocabulary* is a computer concept that predicts the use of previously agreed or approved terms in the database building.

The spreadsheet is organized as it follows (Figs. 7-8):

Inventory numbe	Horizontal Provenanc	Vertical Provenanc	Class	Fragment	Form	Shape	Ware	Fabri
1	11	IIb	Unglazed	Rim	Closed	Jug	Burnished	2.2
2	11	IIb	Unglazed	Rim	Open	Cup	Common	2
3	11	IIb	Unglazed	Rim	Closed	Jar	Ribbed	2
4	11	IIa	Unglazed	Rim	Open	Basin	Ribbed	2
5	11	IIa	Unglazed	Rim	Closed	Jar	Common	2
6	11	IIa	Unglazed	Rim	Closed	Jar	Common	2
7	11	IIa	Unglazed	Rim	Closed		Common	2
8	11	IIa	Unglazed	Rim	Closed	Jar	Common	4
9	11	IIa	Unglazed	Rim	Closed	Jar	Common	2.2
10	11	IIa	Unglazed	Rim			Common	2
11	11	IIa	Unglazed	Rim	Open	Cup	Burnished and ribbed	2
12	11	IIb	Unglazed	Rim	Open	Cup	Burnished	2
13	11	IIb	Unglazed	Rim	Open	Cup	Common	2
14	11	IIb	Unglazed	Rim	Open	Cup	Ribbed	4
15	11	IIb	Unglazed	Rim	Open	Cup	Ribbed	4
16	11	IIb	Unglazed	Rim	Open	Cup	Burnished and ribbed	2
17	11	IIb	Unglazed	Rim	Open	Basin	Ribbed	2
18	11	IIb	Unglazed	Rim	Open	Basin	Common	2
19	11	IIb	Unglazed		Closed	Small olla	Painted Historical Sistanic	2
20	11	IIb	Unglazed		Closed	Small olla		5

Fig. 7 - Section of the spreadsheet containing the columns: Inventory number, Horizontal Provenance, Vertical Provenance, Class, Fragment, Form, Shape, Ware and Fabric

Decoration	Dimensio	Drawing	Photo
			..\..\..\QT\Unglazed Pottery\Qt_inv-1
			..\..\..\QT\Unglazed Pottery\QT_inv-2
		..\..\..\QT\Drawings Unglazed Pottery\QT_inv-3.png	..\..\..\QT\Unglazed Pottery\QT_inv-3
			..\..\..\QT\Unglazed Pottery\QT_inv-4
			..\..\..\QT\Unglazed Pottery\QT_inv-5
			..\..\..\QT\Unglazed Pottery\QT_inv-6
			..\..\..\QT\Unglazed Pottery\QT_inv-7
			..\..\..\QT\Unglazed Pottery\QT_inv-8
			..\..\..\QT\Unglazed Pottery\QT_inv-9
			..\..\..\QT\Unglazed Pottery\QT_inv-10
		..\..\..\QT\Drawings Unglazed Pottery\QT_inv-11.png	..\..\..\QT\Unglazed Pottery\QT_inv-11
			..\..\..\QT\Unglazed Pottery\QT_inv-12
			..\..\..\QT\Unglazed Pottery\QT_inv-13
			..\..\..\QT\Unglazed Pottery\QT_inv-14
			..\..\..\QT\Unglazed Pottery\QT_inv-15
		..\..\..\QT\Drawings Unglazed Pottery\QT_inv-16.png	..\..\..\QT\Unglazed Pottery\QT_inv-16
			..\..\..\QT\Unglazed Pottery\QT_inv-17
			..\..\..\QT\Unglazed Pottery\QT_inv-18
Painted		..\..\..\QT\Drawings Unglazed Pottery\QT_inv-19.png	..\..\..\QT\Unglazed Pottery\QT_inv-19

Fig. 8 - Section of the spreadsheet containing the columns: Decoration, Dimension, Drawing and Photo

Inventory - here we find a progressive number from 1 to 200. Inventory numbers have been assigned during previous studies.

Horizontal Provenance - refers to the trench of finding. This field made possible to restrict the options as it follows: 1, 1A, 1B, 1bis S, 2, 2A, 2B, 3, 3A, 3B, 3bis, 3-4 B, 4A, 4B, 5A, 5B, 6, 6A, 6B, 11, 11 B-E, S, Unknown. To correctly read the information contained here it is necessary to keep in mind that isolate numbers refer to related trenches (1 = trench QT1), while numbers followed by letters refer to the main excavated trench

Vertical Provenance - refers to the strata of finding. Here the options predisposed as inputs for the principal table are I, Ia, I b-c-d, II, IIa, αII, IIb, III, IIIa, IIIaα, IIIb, IIIc, IV, IVb, IVc, IVd, IV-V, V,

Vb, VI, VII, VIII, d, b-e, pit in III.[5] Roman numbers followed by Latin or Greek letters refers to phases and sub-phases. The progression is from I to VIII, where VIII correspond with the most recent strata.

Class - refers to the two main classes in which the pottery has been divided, that are glazed pottery and unglazed pottery.

Form - here we find two options (closed or open), to define the original form detectable from the fragments. It is not always possible going back to the original form when the fragment is too tiny. That is why the record could be sometimes empty.

Shape - refers to the specific shape to which the fragment was traced back (Amphora, Basin, Bottle, Cup, Dish, Filter, Flacon, Jar, Jug, Lamp, Lid, Miniature Vase, Olla, One-handled Jug, Small Olla). It was particularly relevant to normatize this field choosing as input options pottery shapes recognized during previous studies on the 188 fragments selected, choosing a small but precise corpus of shapes that could enclose satisfactorily all the pottery included in the database.

Ware - refers to the belonging *family* of the fragments. We have four options of insertion (Burnished, Common, Ribbed, Ribbed and Burnished, *Dipinta Storica Sistana*, Slip Painted, *Sgraffito*, *Sgraffito* on Turquoise, Splashed and *Sgraffito*, Monochrome Black, Monochrome Turquoise, Underglazed).[6]

Fabric - refers to the fabric to which the fragment was traced back after the macroscopic analysis.[7] The possible input are: 1, 2, 2.1, 2.2, 2.3, 2.4, 3, 4, 4.1, 5, 5.1, 6, 6.1, 7, 8, 9, 10, 10.1, 10.2, 11, 12.

Decoration - This column only refers to unglazed pottery.[8] The compilation options are eight (Applied, Carinated, Engraved, Engraved and Imprinted, Imprinted, Moulded, Painted, Scratched). Not all the options were used on the 188 fragments taken in account, however plausible types of decoration were established, to ease future entries.

Dimension - here we have the dimensions of the fragments (height, length and thickness in centimetre). Currently we are waiting to review the fragments to insert this specific information.

Drawing - this section contains the link to the directory containing the drawings.[9]

Photos - here we have the link to the directory with the photos taken in 2007 in jpg format.[10] The possibility to have photos and drawings available for most of the fragments, but not all of them, let us understand and face the importance to have a complete information, which includes graphic and photographic data, for the sake of having a documentation accessible over the years. As said before, unfortunately, it was not possible to link each fragment with its photo mainly for two reasons: first, in some cases photos were not even taken and currently it is impossible to know the reason why; second, there are a number of photos taken without label. Without a normatized description of the fragment and the label, it was not possible to associate fragment to photo. Most of all, working on this field of the database let us understand the importance of clear, synthetic, raw information that digitized archaeological material must carry to be legible over time.

Quantitative and qualitative aspects

[5] Unfortunately, it is not always clear what the letters refers to. In particular, it is not currently possible to understand what is the stratigraphic meaning of the Greek letters.

[6] Wares will be discussed in a dedicated paragraph as they are crucial for chronological confrontation.

[7] We expect to conduct archaeometric analyses in the upcoming future, to confirm and improve the previous analysis.

[8] Glazed pottery makes a case of its own, because a more specific and extended description of the decoration is needed.

[9] Drawings were made by Luigi Ricci. Some of them are realized after previous drawings, made during the excavation campaigns. Unfortunately, documentation is not complete and it was not possible to insert a drawing for each fragment. Reorganizing the documentation, 75 over the 187 drawings were not found and we do not even know if they have ever been made. Just in one case (Inv.45) it is confirmed that a drawing does not exist.

[10] Documentation is not completed; 21 photos are still missing.

Previous studies on the pottery made it possible to quantify the pottery fragments. As said above the total amount of the fragments is 1266: 274 fragments of unglazed pottery and 992 fragments of glazed pottery.[11] From the 1266, only the 188 fragments included into the database, related to precise information, as much as photographic and graphic documentation, are going to be analysed. It is important to note that most of the material was just counted, not drawn or photographed. The fragments taken in account are all diagnostic (predominantly rims). The 86% consists of unglazed pottery, while the remaining 14% consists of glazed pottery (Fig. 9).

The ceramic material has been object of a study for what concerns the analysis of fabrics. The fabrics were distinguished through a macroscopic analysis that takes in account compactness, colour, presence/absence of inclusive material, presence/absence and shape of holes, presence/absence of slip, glazing or painting on the surface.[12] 19 fabrics have been distinguished, with an incidence of 48% for fabric 2 (Fig. 10), that characterize unglazed pottery, in particular amphoras, basins, cups, jars, jugs, miniature vases and small olla (Fig. 11).

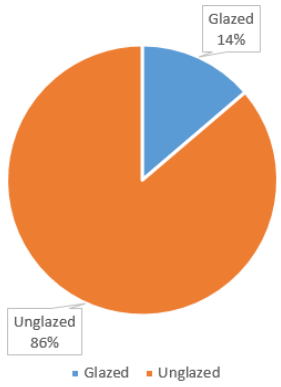

Fig. 9 - Graphic of the proportion between glazed and unglazed pottery

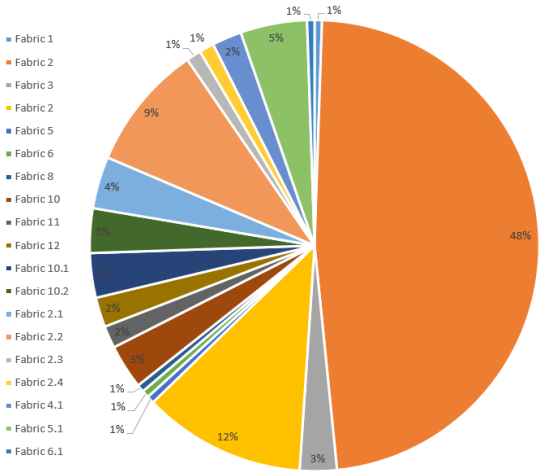

Fig. 10 - Graphic of the fabric's incidence

[11] These numbers come from a 2006 study and could not be verified, due to logistic reasons.

[12] For a precise description of the fabrics please refer to (Genito 2022, pp. 1-35).

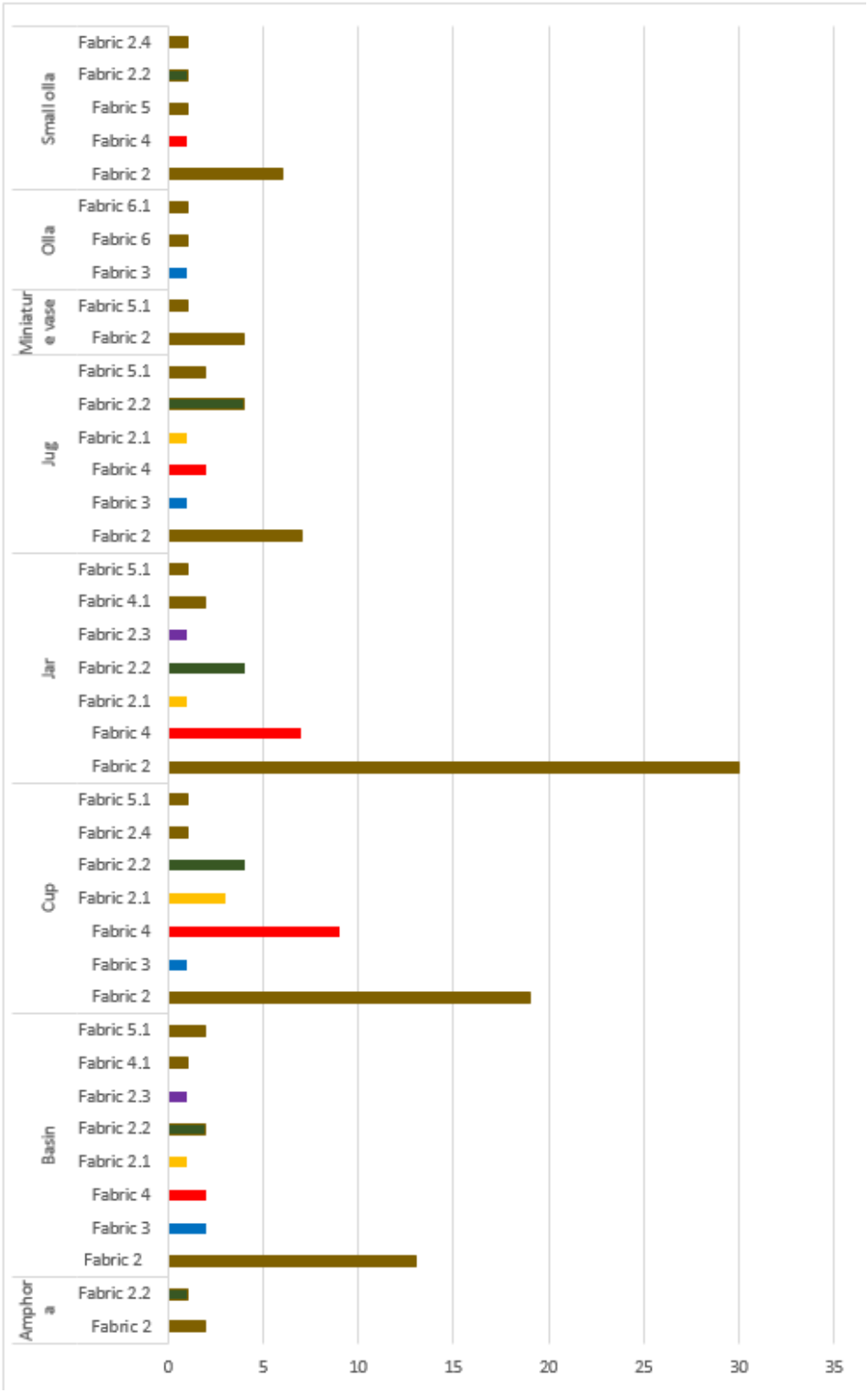

Fig. 11 - Graphic of the ratio between main forms and fabric in unglazed pottery

Shapes and repertory of unglazed pottery

Three functional categories have been distinguished within unglazed pottery: storage ware, table ware and cooking ware, plus some extra cases which are a lamp, a flacon, a filter and miniature vases.

33% of unglazed pottery are storage wares, all closed shapes like amphorae and jars.

Amphorae (3 fragments): diameter between 14-15cm; fabrics 2 and 2.2; white/pale slip; apparently, two types of amphora can be distinguished: first (Inv.37 and Inv.135) with wide carinated neck and strongly everted rim, surely handled, although less can be said about the handles not preserved enough (Fig. 12); second one with narrow, long neck and two straight handles (Fig. 13); all of the fragments are common ware.

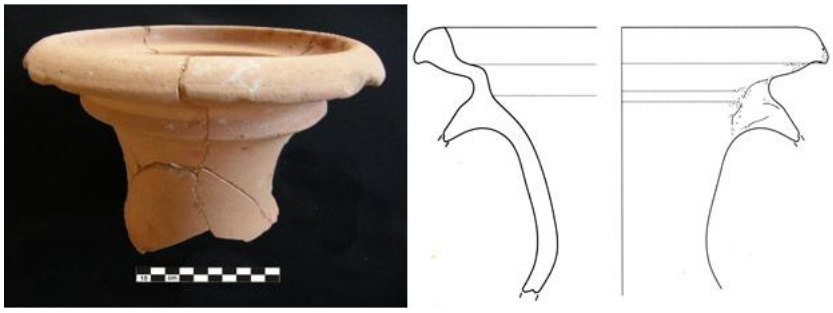

Fig. 12 - QT_inv-135 (Genito 2022, Tab. XX, p. 30)

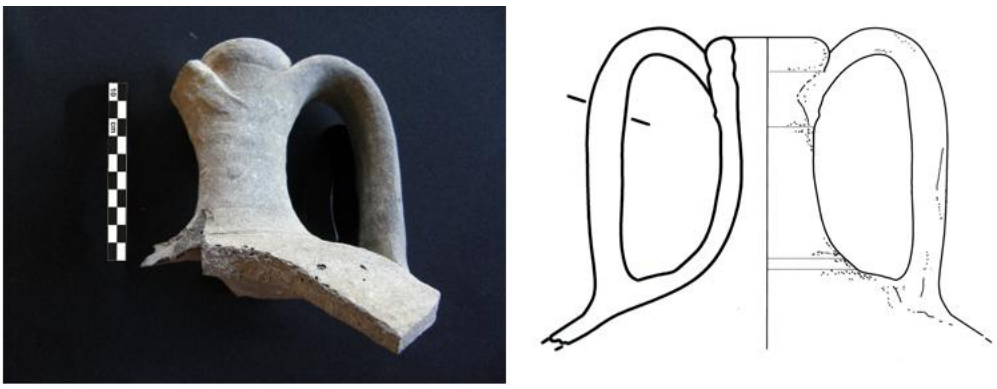

Fig. 13 - QT_inv-197 (Genito 2022, Tab. XX, p. 30)

Jars (46 fragments): diameter between 13-40cm; fabrics 2, 2.1, 2.2, 2.3, 4, 4.1, 5.1; globular body, mainly distinguished between with or without neck (Figs. 14-15); when present, the neck assumes various shapes it can be wide or narrow, subcylindrical or truncated cone; various is the range of rim's types; most of the fragments are common ware; There are four fragments of ribbed ware (Inv.3, 105, 151, 193) and two of burnished ware (Inv.31, Inv. 148); the only type of decoration it was possible to detect is the moulded one on few fragments.

20% of the unglazed pottery are cooking ware. We can distinguish between closed shapes like olla and open shapes like basins.

Basins (24 fragments): diameter between 23-46cm; Fabrics 2, 2.1, 2.2, 2.3, 3, 4, 4.1, 5.1 (percentage

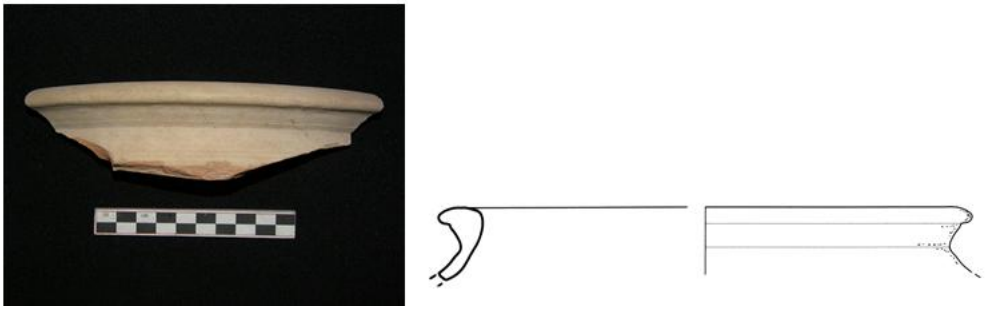

Fig. 14 - QT_inv-107

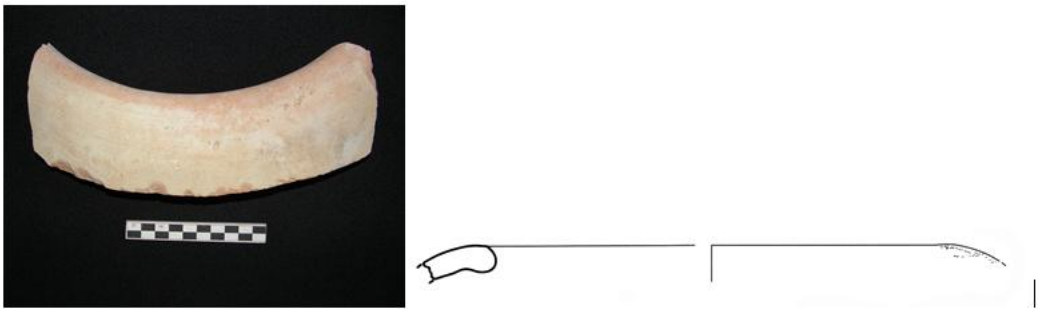

Fig. 15 - QT_inv-195

shown in image tot); globular body, mainly with rounded everted rim, or flat rim (Fig. 16); there are five fragments (Inv.4, 17, 48, 113, 132) of ribbed ware and three fragments of burnished ware (Inv.34, 114, 190); the decoration is mostly moulded (Fig. 17).

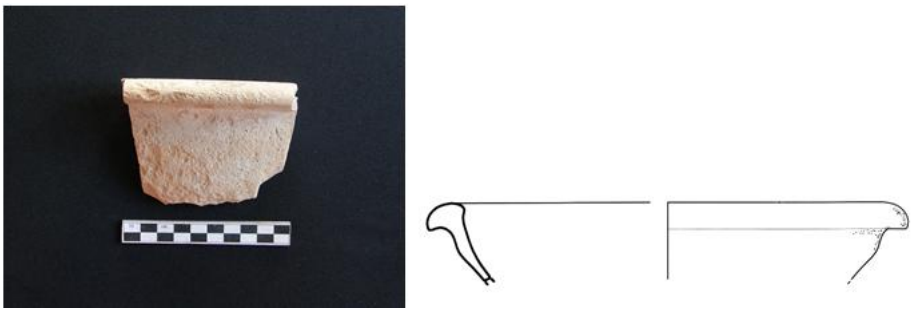

Fig. 16 - QT_inv-129

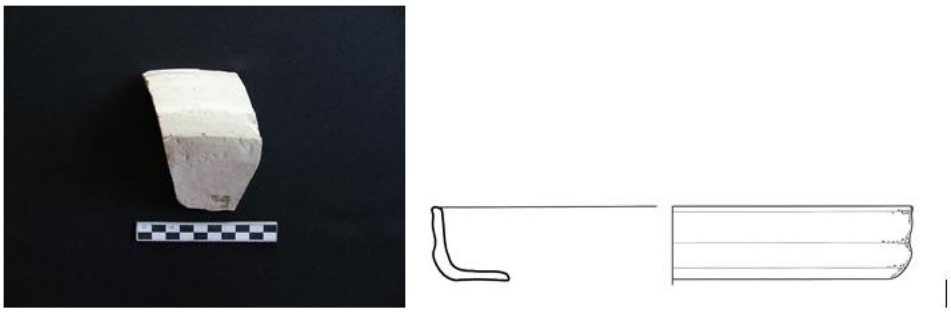

Fig. 17 - QT_inv-192

Olla (3 fragments): diameter between 14-35cm; fabrics 3, 6, 6.1; globular or subcylindrical body (Fig. 18); no decoration; all the fragments are common ware.

Lids (2 fragments): fabrics 1, 4.1; one of hemispherical shape and central grip (Inv.158) one of truncated cone shape, with engraved and imprinted decoration (Inv.186); all of the fragments are common ware (Figs. 19-20).

47% of the unglazed pottery are table ware. We can distinguish between closed shape like bottles, filters, jugs and one-handled jugs, small olla or open shapes like cups.

Bottles (1 fragment): diameter 4cm; fabric 4; long narrow neck, probable ovoid body; common ware, engraved decoration on the shoulder (two parallel lines) (Fig. 21).

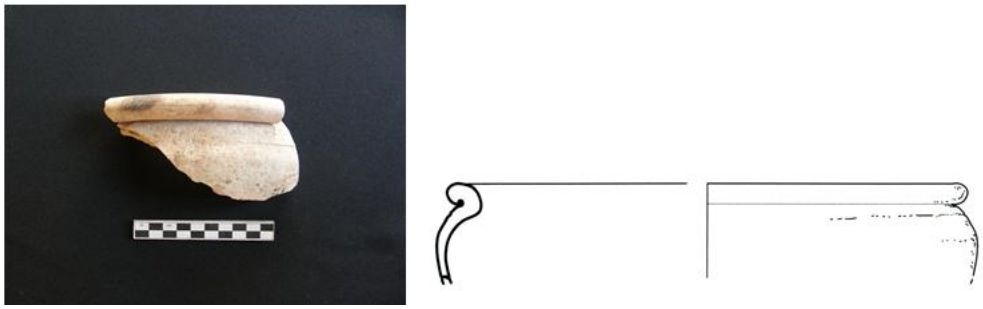

Fig. 18 - QT_inv-137 (Genito 2022, Tab. XII, p. 27)

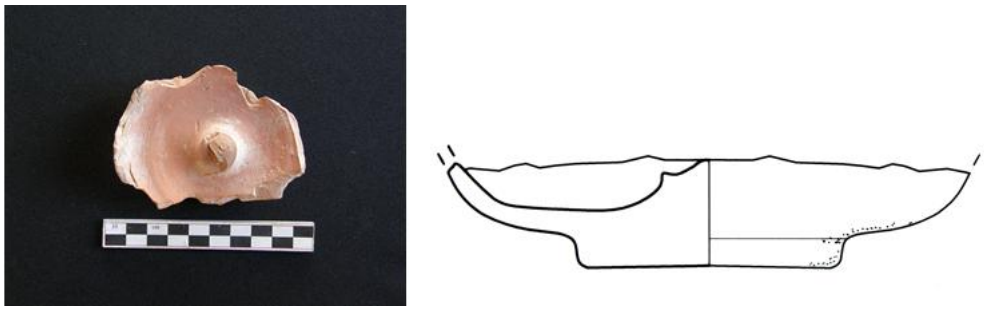

Fig. 19 - QT_inv-158 (Genito 2022, Tab. XXIII, p. 32)

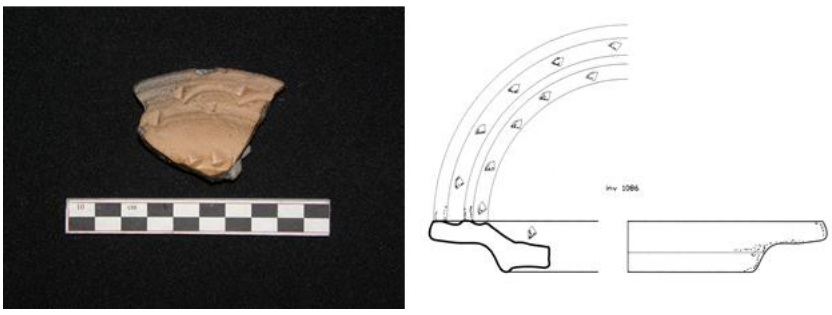

Fig. 20 - QT_inv-186 (Genito 2022, Tab. XXIII, p. 32)

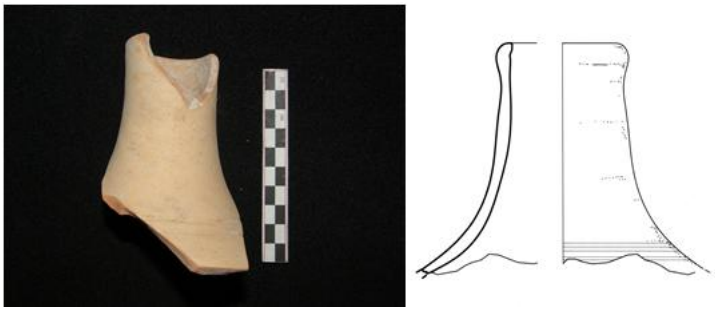

Fig. 21 - QT_inv-185 (Genito 2022, Tab. XXI, p. 31)

Cups (38 fragments): diameter between 11-25cm; fabrics 2, 2.1, 2.2, 2.4, 3, 4, 5.1; slightly carinated on the shoulder or body, with great variety of rim's shapes (Fig. 22); clear slip survived in some cases; four fragments are burnished ware (Inv.12, 118, 120, 184), seven are ribbed ware (Inv.14, 15, 30, 63, 121, 127, 150) and five are both burnished and ribbed (Inv.11, 16, 41, 42, 174); the rest of the fragments are common ware; most of the fragments present no decoration, few of them are moulded or carinated; Inv. 21, 51 and 138 preserve red painted geometric decoration.

Jugs (16 fragments): diameter between 7-13cm; fabrics 2, 2.1, 2.2, 3, 4, 5.1; mostly with narrow

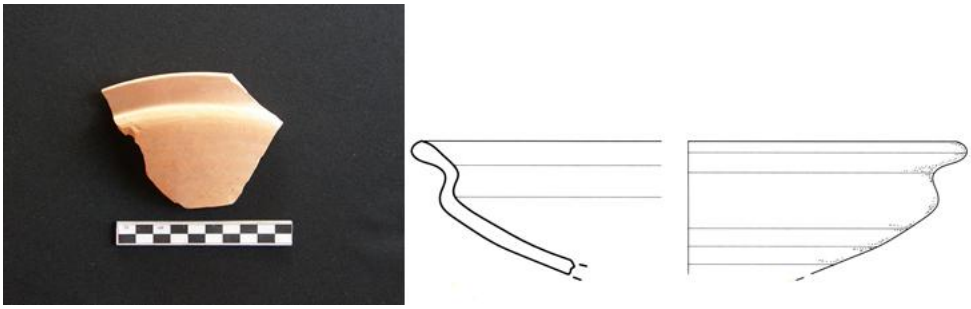

Fig. 22 - QT_inv-172

neck, subcylindrical or truncated cone, mostly with everted rim (Fig. 23); some of them are ribbed ware (Inv.108, 168) or burnished ware (Inv.1, 149, 169, 189, 194); most of them are common ware; few fragments present moulded decoration.

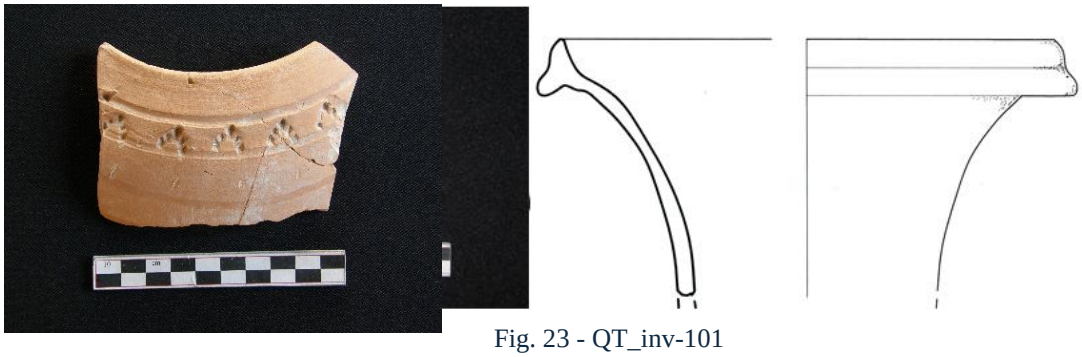

Fig. 23 - QT_inv-101

One-handled jugs (3 fragments): fabric 5.1; traces of white slip are preserved on Inv.122 and 143; Inv.176 imprinted and engraved decoration (Fig. 24), while Inv.122 is carinated (Fig. 25) and Inv.143 is moulded; two of the fragments are common ware, while Inv.176 is burnished ware.

Small olla (10 fragments): diameter between; fabrics 2, 2.2, 2.4, 4, 5; globular or sub-cylindrical body, with short neck in the first cases, no neck in the second; mainly very thin walls; most of them are common ware; Inv.19, 28 and 29 present red painted geometric decoration and fall into the class of the *Dipinta Storica Sistana* pottery (Fig. 26).

Fig. 24 - QT_inv-176 (Genito 2022, Tab. XIX, p. 30)

Fig. 25 - QT_inv-122

Fig. 26 - QT_inv-19, QT_inv-28, QT_inv-29 (Genito 2022, Tab. XI, p. 26)

Extras

Filters (1 fragment): there is just one example of filter, characterized by two holes on the top; fabric 2.2 (Fig. 27).

Flacons (1 fragment): there is just one example of flacon, characterized by a flat, biconical body, with flat base and rounded rim; diameter 2cm; fabric 2.1 (Fig. 28).

Lamps (1 fragment): fabric 8; lamp base with imprinted decoration (Fig. 29).

Miniature vases (5 fragments): fabrics 2, 5.1; strongly everted rim, narrow neck and possible globular body (Inv.100, 146, 153) (Fig. 30) or globular body and rounded rim (Inv.156, 179); clear slip; most of the fragments are common are, just one is ribbed ware (Inv.156); there is one fragment with moulded decoration (Inv.179).

Fig. 27 - QT_inv-181

Fig. 28 - QT_inv-198 (Genito 2022, Tab. XXIV, p. 32)

Fig. 29 - QT_inv-110

Fig. 30 - QT_inv-146

Shapes and repertory of glazed pottery

They have been distinguished two functional categories between glazed pottery: table ware and cooking ware.

99% of the pottery falls into table ware. We have open shapes like cups and dishes, or closed shapes like jugs.

Cups (17 fragments): fabrics 10, 10.1, 10.2, 11, 12; four fragments can be put among slip painted ware, three are monochrome turquoise ware, four are *sgraffito* ware, four are splashed and *sgraffito* ware and two are underglazed ware; there is high variability in the shapes as shown by the drawings.

Dishes (4 fragments): fabrics 10, 11, 12; three fragments can be put among *sgraffito* on turquoise ware, while just one among slip painted ware.

Jugs (3 fragments): fabric 10, 10.1; two slips painted and one monochrome black.

Among cooking ware, we only have one basin fragment of monochrome turquoise, fabric 11.

Among glazed pottery a more regular ratio between form and fabric, as well as between ware and fabric, can be observed, as we can see from the graphics (Fig. 31).

Slip painted is mostly fabric 10, with just two examples of fabrics 10.1 and 10.2. *Sgraffito* or splashed and *Sgraffito* ware are mostly between fabrics 10.1 and 10.2, with just one example of fabric 10. Monochrome turquoise and *Sgraffito* on turquoise wares are mostly between fabrics 11 and 12, with just two examples of fabric 10.2. For underglazed ware and monochrome black has less sense having a statistical approach, due to the few fragments available (2 for the first ware, just one for the second). In general, is clear enough that glazed wares present low variability in the fabrics.

Fig. 31 - Graphic of the ratio between form and fabric in glazed pottery

Attempting a chronology

First of all, it must be said that the number of fragments we are working on is quite exiguous, even if they are representative enough of all the pottery collected in Qalʿa-ye Tepe. Furthermore, there are not whole forms and the fragments come from different trenches: the principal trench QT and trenches QT1, 2, 3, 4, 5, 6 and 11. In this analysis, that is already poor in samples, only fragments for which we have a clear indication of the vertical provenance have been taken in account. Without it, in fact, the fragments have no stratigraphic meaning. Unfortunately, just 149 fragments out of 188 carry this information.

Strata VIII-III

Here fragments coming from strata VIII-III, referable to period III, above defined as Islamic Period, are going to be analysed. The author decided to unify fragments coming from these strata because of the homogeneity of the characteristics that was possible to detect. Most of the fragments come from the main trench QT (sectors 1B, 3A, 3B, 4A, 4B, 5A, 5B, 6A, 6B). Just one fragment (Inv. 38) come from trench QT11.

Starting with unglazed ware, this class of material is particularly tricky, because of the extraordinary continuity in fabrics, decoration e forms it was possible to detect among fragments at our disposal. Only few slight differences can be underlined here. The majority of the unglazed fragments coming from the strata in analysis fall into the category of common ware. Particularly relevant are

moulded and engraved/imprinted fragments,[13] which are quite comparable with fragments coming from most recent strata identified by Gullini in Kuh-e Khwaja (I-III). Despite the highly disputed chronology, is it possible that these strata could fall under a period between the late sasanian and the islamic era, due to the presence of Islamic glazed ware, also present (Gullini 1964, pp. 224-227; p. 242, pls. 170-171) and comparable to the fragments from Qalʿa-ye Tepe.

Continuing our discussion about common ware, particularly relevant is the ribbed ware. Ribbed ware in Sistan have a very long history dating back to the Achaemenid era (6th-3rd BCE). In fact, we know of famous ribbed beakers found in two important sites of Sistan dated to Achaemenid period: Dahan-e ye Gholaman (Genito 1990, pp. 587-604) and Nad-i Ali (Ghirshman 1939, pp. 10-22; Besenval, Francfort 1994, pp. 3-14). A fair number of ribbed ware fragments were also found in Kuh-e Khwaja, from strata IV to strata I. We are almost certain that the usage of ribbed ware remains constant until proto-Islamic/Islamic era.

Chronological limits are very wide; however, slight differences between ribbings could be traced, as suggested by Gullini. In fact, ribbed ware coming from the strata in analysis present more jutting and almost moulded ribs (Fig. 32) than ribbed ware from more ancient strata that is going to be discussed next, almost perfectly comparable to the ribbed ware from most recent strata of Kuh-e Khwaja (Gullini 1964, pp. 224-226; p. 242, pls. 170-171).

Fig. 32 - QT_inv-132 (Genito 2022, tab. VII, p. 25)

Speaking of burnished ware, examples in our database present thin parallel lines (Fig. 33), comparable to those described by Gullini for Kuh-e Khwaja, coming from all the strata with slight differences (Gullini 1964, pp. 224-236). Burnished ware is also present in more ancient strata at Qalʿa-ye Tepe. However, as the ribbed ware, the burnished ware has also a wide chronological range. Burnished ware is well known in North-eastern Iran sites such as Shahr-i Qumis and Tureng Tepe and the origin trace back to Bronze Age (Haerinck 1983, pp. 191-196). Unfortunately, material from Qalʿa-ye tepe is not quite comparable to the material from North-East Iran, but only in shapes like the carinated cups. This is because we are dealing with few and too small fragments to attempt a real comparison. However, it was necessary to underline the fact that the burnished ware has a long tradition too and is quite difficult to trace even the slightest differences in such a complex tradition continuity.

Fig. 33 - QT_inv-74 (Genito 2022, tab. IV, p .23)

Moving to glazed ware, it is more datable for certain. As discussed above, the database contains a few fragments of Islamic glazed ware, mostly very tiny and never full profiles. Despite this the decoration tells us a lot about the dating.

As for the other fragments, stratigraphical information could not be always detected. For just 11 out the 25 of glazed ware fragments we have the vertical provenance. Mostly they are from strata III.

It was possible to recognize the types listed above, useful to attempt a chronology.

Starting from splashed ware, originated in Iraq (Fehervari 1985, p. 23) it was obtained applying on the pottery transparent glaze on which decoration consisted of metal oxide-based paint which vary in a range of colours between green, yellow and brown. Paint drips on the glaze, creating sort of stains, apparently haphazard but in some cases could probably be arranged in patterns (Whitehouse 2011). Dating is based mostly on pottery coming from Samarra, between 9th and 10th century. However, our fragments are examples of Splashed and *Sgraffito* ware (Figs. 34-35). This kind of decoration is spread

[13] In particular, we would like to point out inv.176 (Fig. 25).

from Syria to Khorasan (Lane 1965, pp. 25-27) and it is very common in Iran. It is datable in a period between 12th and 13th century (Fehervari 1985, p. 19).

Fig. 34 - QT_inv-70 (Genito 2022, Tab. XXVIII, p. 34)

Fig. 35 - QT_inv-87

Speaking of *Sgraffito* ware, Iran develops a peculiar tradition. This ware seems to imitate sasanian metalworks through the engraved decoration that goes from geometric, to floral, or representing birds and other animals (Lane 1965, p. 26, pls. 31B, 32B, 33B; Fehervari 1985, p. 32). Technically, the decoration was obtained engraving a buff or white slip on a darker ceramic body (Grube 2011), subsequently filled with transparent, green, yellow or brown glaze (Fehervari 1985, p. 32). Commonly, *Sgraffito* ware dates between 10th and 13th century. Latest pottery present deep engraved slip.[14] In our case, Inv.65 (Fig. 36) and Inv.82 preserve a tiny part of a geometric/floral decoration carved on a green background which seems to be datable in a period between the 11th and the 13th century (Fehervari 1985, pp. 32, 113, 114).

Fig. 36 - QT_inv-65 (Genito 2022, Tab. XXVII, p. 34)

For what concerns slip painted ware, it was a Persian innovation. Using slip to paint complex decorative motives, avoided the problem of the dripping paint under the glaze (Fehervari 1985, p. 23). Examples of Slip Painted occur in Iran and large part of Transoxiana (Whitehouse 2011). A classification of Slip Painted ware was made after Nishapur pottery (Wilkinson 1973). It originated between 9th and 10th century and persisted for a very long period (Fehervari 1985, pp. 23-24; pp. 90-102). Our samples of Slip Painted ware (Figs. 37-38) are quite comparable with other examples of this pottery from all over Iran.

Fig. 37 - QT_inv-67 (Genito 2022, Tab. XXV, p. 33)

Fig. 38 - QT_inv-73

Fabric 12 correspond to the commonly said frit ware. The term refers to an artificial ware made of quartz, white clay and potash, which was fired at very high temperatures, obtaining a sort of glassy and solid pottery. Probably the technique firs developed in Egypt, but highly spread in Iran. It is datable between 11th and 13th century, through firmly dated ceramic object bearing inscriptions with name of the artist and date (Grube, 2011). In our database this fabric corresponds to two fragments of underglazed pottery (Fig. 39), two fragments of *Sgraffito* on Turquoise (Fig. 40) and one fragment of Monochrome turquoise (Fig. 41). Monochrome Turquoise pottery is quite common in all Middle East. Seljuk examples are very recognizable for the alkaline glaze on frit ware and are datable between the 12th and the 13th century (Fehervari 1985, p. 35).

In conclusion, it can be said that Islamic pottery from Qalʿa-ye Tepe can be datable in a period between the 9th and the 13th century.

Fig. 39 - QT_inv-66 (Genito 2022, Tab. XXVI, p. 33)

[14] Fehervari refers to this kind of pottery with the term champlevé. Commonly used for metalwork, the term refers to a technique that consists of a deep engraving, almost carved.

Fig. 40 - QT_inv-79

Fig. 41 - QT_inv-78

Strata II

Now strata II, referable to period II, possibly parthian/early sasanian (3rd century BCE-3rd century CE) is going to be discussed. 65 of the fragments came from strata II and subfaces. Most of the fragments came from trench QT11, while Inv.68, 139, 140, 141, 142, 144 and 147 come from the principal trench QT (sectors 1A, 1B, 2A, 2B) and inv.145 come from trench QT2.

64 out of the 65 fragments are unglazed pottery. There is only one fragment of splashed and *Sgraffito* ware, which could be intrusive. Most of the fragments are from what here was defined as common ware, although a discrete quantity of burnished ware and ribbed ware can be enumerated.

Fig. 42 - QT_inv-48 (Genito 2022, Tab. VII, p. 25)

As said above, ribbed and burnished ware are quite relevant for chronological reasons. Resuming the discussion about ribbed ware, as already said, chronological limits are quite wide. Ribbed ware is endemic in Sistan since Achaemenid era. Comparable examples for ribbed ware are again from Kuh-e Khwaja, strata III and IV (Gullini 1964, pp. 230-232; p. 243, pls. 172-173). Gullini's description of the fabrics and slips quite matches the examples from Qalʿa-ye Tepe considered in our database. Mostly pink, to reddish/orange fabrics, with clear slip, not always preserved. Ribs are more regular and transition between them softer, making ribbing almost rounded (Fig. 42).

Little can be added to what has already been said about burnished ware, as we have very tiny fragments about which is very difficult to understand out the burnish expanded on the ceramic body. All can be attempted to be said is that the burnishing seems to be less organized as compared to that of the fragments from late strata, probably covering the body of the vase or realized emulating sort of drippings, decoration particularly present in strata I (Figs. 43-44).

Fig. 43 - QT_inv-11 (Genito 2022, Tab. I, p. 22)

Fig. 44 - QT_inv-1

About the painted pottery, we must talk about the so called *Dipinta Storica Sistana*[15] ware. In our database we have three examples all attributable to small olla. The decoration consists of a geometric pattern realized with reddish/brown pigment. Particularly relevant is Inv.19, which preserve an unequivocal decoration with a horizontal band along the rim from which depart two overlapped triangles (Fig. 26). These fragments are comparable to those attested in Qalʿa-ye Sam (Haerinck 1983, p. 219, fig. 37; Genito 2021, p. 4) and Kuh-e Khwaja (Gullini 1964, pp. 231-234). It is a strongly affirmed local

[15] Umberto Scerrato proposed to give this name to the class of pottery described, also found in Qalʿa-ye Sam and Kuh-e Khwaja (Genito 2021, p. 4), in order to distinguish it from pre and protohistoric painted pottery.

pottery that seems to appear around 3rd century BCE, continuing until 3rd century CE. Nothing comparable seems to exist in Sistan in Achaemenid era, as demonstrated by the pottery found in Dahane-ye Gholaman (Genito 1990, pp. 587-604; Haerinck 1983, p. 220).

Strata I

Pottery from strata I refers to period I, probably hellenistic/early parthian. Almost all the fragments come from trench QT1, except inv.80 and inv.143 coming from principal trench QT (sector 1B) and Inv.91 coming from trench QT3.

Most of the fragments are common ware. When ribbed, ribbings are quite similar to examples that were described for strata II (Fig. 45). Inv.105 (Fig. 46) present a sort of moulded decoration between the rim and the shoulder of the vase that seems comparable to some examples from strata III of Kuh-e Khwaja (Gullini pl. 172 p. 243). For burnished ware we can distinguish Inv.114 (Fig. 47) and Inv.118 which present the sort of drippings from the rim and Inv.120 (Fig. 48) which present fine parallel lines on the inside of the vase, apparently wider and less organized than the examples described for strata VIII-III.

Outside the discussion that strictly concerns the strata, we would notice that from Qalʿa-ye Tepe we have lots of carinated profiles, in particular cups. Again, it is difficult to attempt chronological statement starting from profiles, as carinated pottery are endemic in Sistan and other area of the Iranian Plateau and are attested from Achaemenid period, as demonstrated again by sites cited above (Genito 1990; Hearinck 1983; Gullini 1964).

Fig. 45 - QT_inv-105

Fig. 46 - QT_inv-121

Fig. 47 - QT_inv-114

Fig. 48 - QT_inv-120 (Genito 2022, Tab. II, p. 22)

Conclusions

It is for certain that the corpus analysed is just a minimal part of the great quantity of the pottery coming from the site. However, despite the exiguous number of pottery fragments, it was possible to test the functionality and the possibility of the database. Through the tool created by us it was possible to attempt a first and preliminary analysis of the quantitative, qualitative and chronological aspects, even if limited to the fragments selected because of their archaeological relevance.

In conclusion, from the confrontation made between fabrics, profiles and decoration of the pottery can be affirmed that the site was probably alive between the 3rd century BCE and the 13th century CE.

Of course, this is a preliminary analysis that do not take in account all the great amount of pottery coming from Qalʿa-ye Tepe, that we look forward to include in the database, to settle a wider and more accurate discussion in future.

To improve the quality of the interpretative analysis, it is necessary to make archaeometric analysis of the pottery, that could help to better understand the nature of the settlement and to clarify some chronological and stratigraphic issues, supporting the existing section and plants of the site and better explain phases and function of the archaeological evidences.

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