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# NEW INSIGHTS ON THE ARCHAIC 'CORINTHIAN B' AMPHORAE FROM GELA (SICILY): THE CONTRIBUTION OF THE ANALYSES OF CORFU RAW MATERIALS

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## ABSTRACT

In this work we report the results of the analysis of clay and sand raw materials collected from the Corfu island (Kanoni area, Ionian Sea). The mineralogical, petrographic and chemical data were compared with those of some archaic 'Corinthian B' amphorae (late 6th – mid 5th c.BC) found in the archeological excavations at Gela (Sicily), and with those of local common wares and tiles from Sibari (ancient Sybaris/Thurii), in southern Italy. Indeed, the 'Corinthian B' transport amphorae, largely diffused in the Mediterranean basin during archaic and classical periods, are supposed to come from several possible centers, including mainly Corfu and Sibari. The combination of both chemical and petrographic investigations strongly supports the archaeological hypothesis of the presence of Corfu products among the archaic 'Corinthian B' amphorae from Gela.

**KEYWORDS:** Raw materials, Laboratory test, Corfu, 'Corinthian B' amphorae, petrographic and chemical analyses.

## 1. INTRODUCTION

In antiquity the transport amphorae were used for shipping goods, principally wine and oil, and for this reason they are considered by modern archaeologists very important evidences of the ancient trades. However, in order to correctly reconstruct the trade networks between ancient settlements, scholars need to precisely locate the production sites of the amphorae and, when possible, also to define what type of products they contained.

In her well-known classification of the Corinthian amphorae, Koehler (1978, 1981, 1992) distinguished two different forms of the type B: i) the earlier one, dated from the VI to the early V century BC, marked by an almond-shaped thickened rim, underlined by an offset band, a turnip-shaped body and a beveled cap toe (Figure 1a); ii) the more recent one, dated from the V to at least the late III century BC, characterized by a thickened rim, almost triangular in section, underlined by one or two ridges or grooves, a spherical or ovoid body and a small conical cap toe (Figure 1b-c). Koehler attributed both forms to Corinth but did not exclude the possibility of other minor production sites: namely, an unidentified western-Greek workshop for the archaic form and a workshop in Corfu, following a previous intuition of V. Grace (1953), for the classical-hellenistic form. Indeed, according to historical sources, Corfu (ancient *Kerkyra)*, a Greek island in the Ionian Sea colonized by the Corinthians, produced a good quality wine in large quantities (Thuc. III, 70, 4; Xen. *Hell.* VI 2, 6; Ath. *Deipn.* I, 33b) which was contained in the so called "*Corcyrean amphorae*" ("*kerkyraioi amphoreis*": Ps. Arist. *De mir. auscult.* 104, 839b; Hesych. A 1201 Latte).

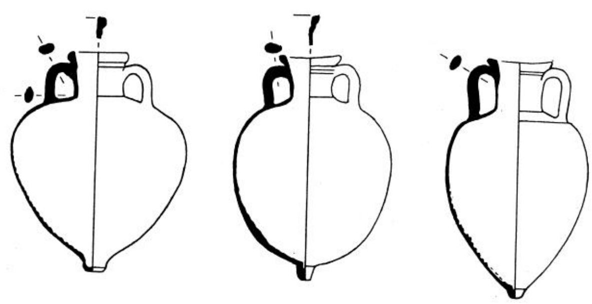


***Figure 1. 'Corinthian B' amphorae: a) archaic form; b-c) classical form. From Koehler (1992).***

In 1983, the discovery of a pottery workshop in Corfu confirmed the existence of a local production of the more recent 'Corinthian B' form (PrekaAlexandri, 1992), which, so, was also called 'Corcirean' (Kourkoumelis, 1992). However, this archaeological evidence did not rule out the possibility of other production centers of the classical-hellenistic form (including Corinth itself) nor did it provide any information on the archaic form and on its origin.

In the meantime, various chemical investigations (Farnsworth et al., 1977; Watson 1985; Jones 1986; Oladipo 1987) did not obtain unequivocal and decisive results, but rather highlighted the difficulty of distinguishing between ceramics from Corinth and Corfu, because of their compositional affinities. Later, the remarkable petrographic study of Whitbread (1995) questioned whether Corinth could be included among the production centers of both forms of the type B, considering the great differences in clay body preparation and in the manufacture between these amphorae and the Corinthian type A, certainly produced there.

Recent archaeometric studies have investigated the possibility of multiple workshops of the type B on all the coasts of the Ionian Sea, both in Greece and in Albania, and in southern Italy (Spagnolo, 2002; Barone et al., 2002, 2004, 2005; Sourisseau, 2011; Gassner, 2011, 2015). In the latter, in particular, the attention of the scholars has focused on the site of Sibari (ancient *Sybaris/Thurii*), since ancient sources attested the region to have a very rich local production of wine during the archaic and classical periods (Timaeus in Ath. *Deipn.* XII, 519d; Strabo VI, 1, 14; Plinius *N.H.* 14, 39), and the image of an amphora was recorded onto an archaic Sybarite coin (Spagnolo, 2002). Chemical and petrographic analyses have been carried out on some archaic 'Corinthian B' amphorae found in Sicily, at Gela (Barone et al., 2004) and Messina (Barone et al., 2002, 2005), and the results have been compared with those obtained from local ceramics and tiles of Sibari (Barone et al., 2004). ICP-OES and ICP-MS data on amphorae from Gela and Messina, respectively, pointed out that some amphorae had low concentrations in Ni and Cr that, according to Jones (1986), Levi (1999) and Barone et al. (2002), can be considered indicator of production areas located in southern Italy, rather than in Greece, where these elements are generally richer. The petrographic analyses of these samples confirmed the existence of two groups of 'Corinthian B' amphorae at Gela, the first one characterized by inclusions typical of the Calabrian–Peloritan area (Amodio Morelli et al., 1976), possibly from the area of Sibari and the second one consistent with the 'Corinthian B' amphorae from Greece classified by Whitbread (1995) as 'fabric class 1'(Corfu?).

More recently, observations by reflected light microscope (Gassner, 2011) have been conducted on samples of both 'Corinthian B' forms from Albanian coast and from Velia (southern Italy), and have suggested the existence of almost three production centers in the Ionic-Adriatic region, among which probably Corfu or Butrint.

In this complex scenario, the purpose of this research was to compare some specimens of archaic 'Corinthian B' amphorae found at Gela with a set of clayey materials sampled in Corfu and some fragments of locally produced ceramics and tiles from Sibari (Barone et al., 2004), to define their provenance.

## 2. GEOLOGICAL FRAMEWORK, MATERIALS AND METHODS

Corfu is the second largest island in the Ionian Sea, after Kefalonia, and geologically belongs to the Ionian Zone, characterised by various sedimentary deposits: i) Triassic evaporites and associated breccias; ii) Jurassic to Upper Eocene carbonates and to a lesser degree cherts and shales; iii) Oligocene Flysch. The cover of the Ionian Zone sequence is represented by Miocene – Pliocene plastic mudrocks and marls such as those sampled for the present study, located near the archaeological site. The end of sedimentary sequence consists of Quaternary alluvium (Savoyat and Monopolis, 1970).

Different raw materials, such as clays and sands, were collected from various points of the Kanoni area in the eastern coast of the island. In particular, four clays (CORFU1A-4A) and three sands (CORFU1S-3S) were samples, respectively in the north and in south of aforementioned area were sampled in the north (Figure 2).

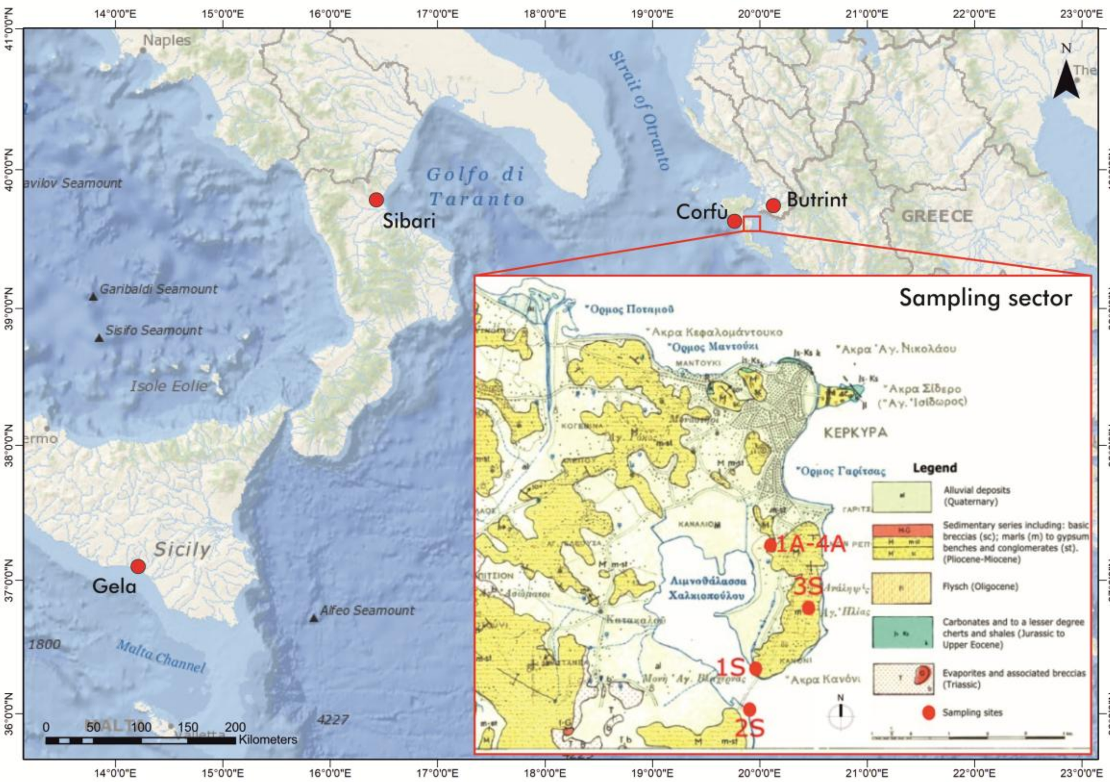


***Figure 2. Overview map of Ionian Sea and focus on the geological map (modified after Savoyat and Monopolis, 1970) of the sampling sector where the raw materials were collected (CORFU1A-4A and CORFU1S-3S) in the north part of Corfu island.***

The raw materials were analysed in terms of their i) grain-size distribution, using a sieving method and gravitational sedimentation; ii) chemical composition by X ray fluorescence (XRF); iii) mineralogical composition by X-ray diffraction (XRD). Afterwards, four laboratory tests were prepared using 90% of the clayey sediments and 10% of sandy sediment (named CORFU#-10S). This ratio was chosen based on microscopic observations of thin sections of the Gela amphorae (Barone et al., 2004). For the preparation of the laboratory tests, we chose only one sample of sand (CORFU3S) since previous XRD and chemical analyses attested that they were similar in terms of composition. Each laboratory test underwent firing at different temperature (700, 800 and 900°C) in an oxidant atmosphere using a laboratory muffle, with a temperature increase of 100 °C/hour and the maintenance of the maximum constant temperature for 12 hours (soaking time). Afterwards, they were investigated by optical microscopy (OM), XRD and XRF at the Department of Biological Geological and Environmental Science of the University of Catania.

In details, XRD data were collected with a Siemens D5000 diffractometer, with Cu Kα radiation and Ni filter, in the 2θ-range 3–70°, using a step size of 0.02°, a counting time of 5 s per step, divergence and antiscatter slits of 1° and receiving slit of 0.2 mm. With the aim to obtain information about clay minerals, oriented slides of the <2 μm grain-size fractions were scanned from 2° to 45° 2θ with a 0.02° 2θ step size and a 4 sec count time, at 30 mA and 40 kV. The presence of swelling clay minerals was determined by treating samples with ethylene glycol at 60 °C for 12 h.

XRF was performed using Philips PW 2404/00 spectrometer to determine concentrations of major and trace elements, on powder-pressed pellets, according to the procedure described in Barone et al. (2014, 2012). The chemical analysis of laboratory tests was performed on the 900° C fired samples. In addition to the raw material collected from Corfu, a set of archaic 'Corinthian B' amphorae from Gela, and common ware and tiles from Sibari were analysed by XRF (Table 1) although already previously investigated, since the chemical data were obtained with different analytical techniques. Relevant and very recent investigations using similar techniques have been reported elsewhere (Kouhpar et al., 2017; Javanshah, 2018; Fantuzzi and Cau, 2017).

***Table 1. List of considered samples and analytical methods used in this work (symbols: x= carried out analysis; * = analysis performed in Barone et al., 2004, whose data we used for our considerations; - = no analysis performed).***

| Type | Sampling location | Sample | Grain-size analysis | XRD | OM | XRF |
|---|---|---|---|---|---|---|
| Clayey sediments | Corfu | CORFU1A | x | x | - | x |
| | | CORFU2A | x | x | - | x |
| | | CORFU3A | x | x | - | x |
| | | CORFU4A | x | x | - | x |
| Sandy sediments | Corfu | CORFU1S | x | x | - | x |
| | | CORFU2S | x | x | - | x |
| | | CORFU3S | x | x | - | x |
| Laboratory tests | Corfu | CORFU1-10S700 | - | x | - | - |
| | | CORFU1-10S800 | - | x | - | - |
| | | CORFU1-10S900 | - | x | x | x |
| | | CORFU2-10S700 | - | x | - | - |
| | | CORFU2-10S800 | - | x | - | - |
| | | CORFU2-10S900 | - | x | x | x |
| | | CORFU3-10S700 | - | x | - | - |
| | | CORFU3-10S800 | - | x | - | - |
| | | CORFU3-10S900 | - | x | x | x |
| | | CORFU4-10S 700 | - | x | - | - |
| | | CORFU4-10S 800 | - | x | - | - |
| | | CORFU4-10S 900 | - | x | x | x |
| Archaic 'Corinthian B' Amphorae | Gela | CorB3 | - | * | * | x |
| | | CorB6 | - | * | * | x |
| | | CorB11 | - | * | * | x |
| | | CorB13 | - | * | * | x |
| | | CorB17 | - | * | * | x |
| | | CorB18 | - | * | * | x |
| | | CorB21 | - | * | * | x |
| | | CorB22 | - | * | * | x |
| Common wares and tiles | Sibari | SIB 5 | - | * | * | x |
| | | SIB 12 | - | * | * | x |
| | | SIB 14 | - | * | * | x |
| | | SIB 18 | - | * | * | x |

Finally, chemical data were treated with statistical multivariate methods, according to the method proposed by Aitchison (1986). In detail, the centred log-ratio transformation (clr) of data was applied as follows: $x \in S^D \rightarrow y = \ln (x_D / g_D (x)) \in R^D$ where x is the vector of the D elemental compositions, y is the vector of the log-transformed compositions, xD = (x1, x2, . . . , xD) and gD(x) = (x1•x2•. . .•xD)1/D. This operation converts the raw data from their constrained sample space, the simplex Sd(d = D - 1), into the real space Rd, in which parametric statistical methods can be applied to the transformed data. Subsequently, the clr-transformed data set was explored by biplots, a graphical representation of variables and cases projected on the principal component planes. Both the clr-transformation and biplot diagrams were obtained using CoDaPack (Thio-Henestrosa and Martin Fernandez, 2005), a compositional software that implements the basic methods of analysis of compositional data based on log-ratios.

## 3. RESULTS AND DISCUSSION

### *Raw materials*

The results of the grain-size analyses of the clayey sediments, reported in the Sheppard triangular classification diagram (Figure 3), show that samples CORFU1A, 2A and 4A are plotted on the clayey-silt field, while sample CORFU3A can be classified as silty-sand even if it shows a noticeable plasticity. Regarding the sampled sand sediments (CORFU1S, 2S and 3S), they are coarse sands with predominance of clasts larger than 1 mm.

The mineralogical composition of clayey sediments (Table2) is dominated by clay minerals and quartz that are more abundant in the CORFU3A sample, calcite is quite abundant, while feldspars are present in minimum amount. XRD analysis of oriented powders (air-dried and ethylene-glycol solvated slides) of the clay-sized fraction (<2 µm) allowed the identification of illite/smectite mixed-layers, illite, chlorite and kaolinite, in order of abundance.

Major and trace elements concentrations are listed in Table 3. Clayey sediments show chemical compositions typical of carbonate rich mudrocks with high CaO values (16.96 – 19.22 wt%) and $Al_2O_3$ ranging from 10.79 to 11.21 wt%. Sand samples have a very similar composition with higher content in $SiO_2$ and CaO and lower $Al_2O_3$.

### *Laboratory tests*

Petrographic analysis was performed on 4 laboratory tests fired at 900°C (CORFU1-10S900, CORFU2-10S900, CORFU3-10S900, CORFU4-10S900), obtained mixing sampled clay sediments with 10% of sand CORFU3S (considered as representative sample), in a ratio 9:1. All the laboratory tests are characterised by bimodal grain-size distribution of inclusions with the coarse fraction (>1mm) mainly formed by subangular clasts and subordinately by serpentinised basic volcanic rocks (Figure 4). Fine inclusions (more abundant in the CORFU3-10S900) are composed of quartz grains and subordinately of altered K-feldspar and plagioclases. The groundmass has homogeneous structure and a color from beige to light brown.

The mineralogical composition changes of laboratory tests with the firing temperature (700, 800 and 900°C) was supervised by Table 2. At 700°C we assist to a decrease of calcite and clay minerals content with respect to the base clays, while samples fired at 800°C are characterized by the crystallization of Ca-silicates (anorthite, diopside and gehlenite), which increase in terms of abundance in the samples fired at 900°C.

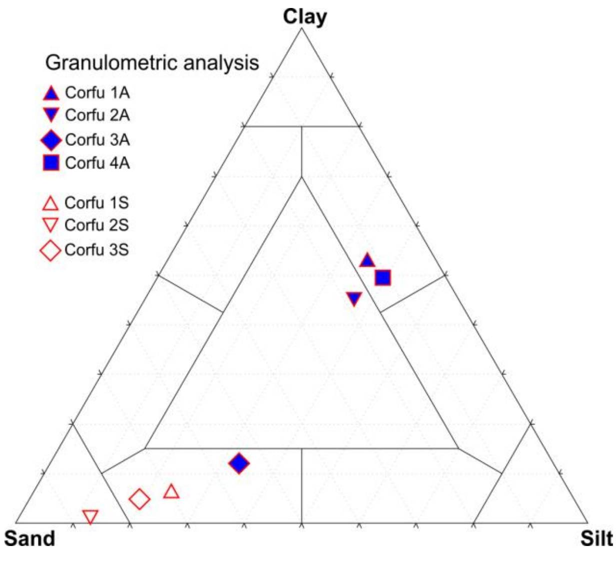


*Figure 3. Grain-size classification according to Sheppard's diagram for the sediment sampled in Corfu (CORFU1A-4A and CORFU1S-3S).*

***Table 2. Mineralogical compositions of studied raw materials and laboratory tests (in italic). Abbreviations and symbols: Qz = quartz; Kfd + Ab = K-feldspar and albite; Cc = calcite; C.M. = clay minerals; An = anorthite; Di = diopside; Geh = gehlenite; Hm = hematite; I/S = illite/smectite; I = illite; Ch = chlorite; K = kaolinite; tr = in trace; * = scarce; ** = abundant, *** = very abundant.***

| | Total sample | | | | | | | | Clay size fraction (<2μ) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample | Qz | Kfeld + Ab | Cc | C.M. | An | Di | Geh | Hm | I/S | I | Ch | K |
| CORFU1A | ** | * | ** | *** | - | - | - | - | *** | ** | * | * |
| CORFU2A | ** | * | ** | *** | - | - | - | - | *** | ** | * | * |
| CORFU3A | *** | * | ** | ** | - | - | - | - | *** | ** | * | * |
| CORFU4A | ** | * | ** | *** | - | - | - | - | *** | ** | * | * |
| CORFU1S | *** | * | ** | - | - | - | - | - | - | - | - | - |
| CORFU2S | *** | * | ** | - | - | - | - | - | - | - | - | - |
| CORFU3S | *** | * | ** | - | - | - | - | - | - | - | - | - |
| *CORFU1-10S 700* | ** | * | * | * | - | - | - | - | - | - | - | - |
| *CORFU2-10S 700* | ** | * | * | * | - | - | - | - | - | - | - | - |
| *CORFU3-10S 700* | *** | * | ** | tr | - | - | - | - | - | - | - | - |
| *CORFU4-10S 700* | ** | * | * | * | - | - | - | - | - | - | - | - |
| *CORFU1-10S 800* | ** | * | - | - | * | ** | * | tr | - | - | - | - |
| *CORFU2-10S 800* | ** | * | - | - | * | ** | * | tr | - | - | - | - |
| *CORFU3-10S 800* | *** | * | - | - | * | * | tr | * | - | - | - | - |
| *CORFU4-10S 800* | ** | * | - | - | * | ** | * | tr | - | - | - | - |
| *CORFU1-10S 900* | *** | * | - | - | *** | ** | - | * | - | - | - | - |
| *CORFU2-10S 900* | *** | * | - | - | ** | ** | - | * | - | - | - | - |
| *CORFU3-10S 900* | *** | * | - | - | *** | ** | - | tr | - | - | - | - |
| *CORFU4-10S 900* | *** | * | - | - | *** | ** | - | * | - | - | - | - |

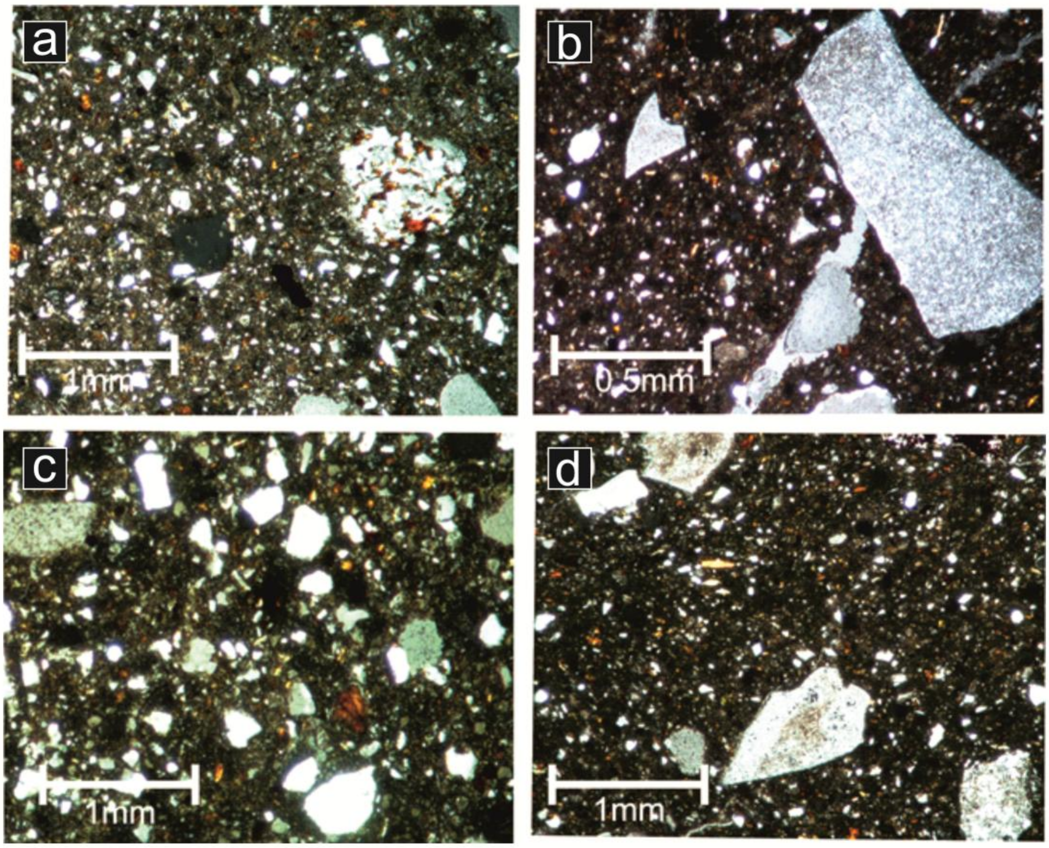


*Figure 4. Crossed-nicols microphotographs of laboratory tests fired at 900°C: (a) CORFU1-10S; (b) CORFU2-10S; (c) CORFU3-10S;(d) CORFU4-10S.*

## 4. THE PROBLEM OF THE PROVENANCE OF 'CORINTHIAN B' AMPHORAE FOUND AT GELA

In order to solve the issue on the provenance of the 'Corinthian B' amphorae, and in particular of those found at Gela archaeological site, a comparison between the studied raw materials and eight samples of this type of amphorae (Barone et al., 2004) was performed. The petrographic analysis pointed out a close similarity between the laboratory tests and amphorae CorB17, CorB18 and CorB21, which macroscopically showed affinities with the "fabric class 1" in Whitbread (1995) classification (Figure 5).

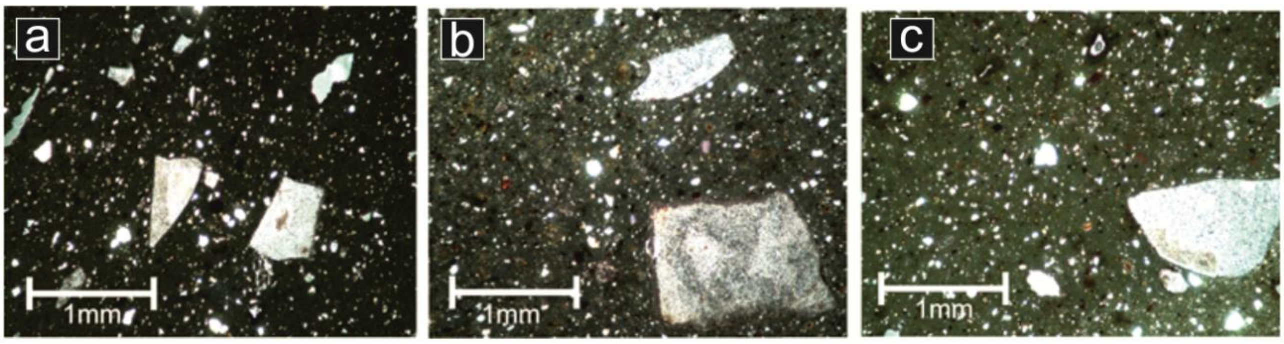


*Figure 5. Crossed-nicols microphotographs of 'Corinthian B' amphorae from Gela: (a) CorB17; (b) CorB18; (c) CorB21.*

On the contrary, microscopic analysis of the other archaic 'Corinthian B' amphorae (CorB3, 6, 11, 13 and 22) found at Gela showed inclusions formed by metamorphic and granitic rock fragments (Barone et al., 2004), consistent with the geology of a different area, supposed to be in Southern Italy, maybe Sibari (Amodio Morelli et al., 1976).

In this context, it is important to compare the chemical data of laboratory tests with those of the Gela amphorae (table 3). Furthermore, in order to explore the possibility that these amphorae were produced in Sibari as archaeologically hypothesized, the chemical composition of common ware and tiles produced in Sibari were also considered into the statistical comparison. In the diagrams of Figure 6, part of the 'Corinthian B' amphorae (samples CorB17, CorB18 and CorB21) plots very close to the Corfu raw materials, while the others (samples CorB3, CorB6, CorB11, CorB13 and CorB22) have higher $Al_2O_3$ and lower Ni and Cr contents, these latter similarly to the Sibari common wares.

Further clear indications about the Corfu production of some of the 'Corinthian B' amphorae come from the statistical multivariate principal component analysis performed using log-ratio technique (Aitchison, 1986). In the biplot (figure 7) of the first two principal components the amphorae supposed to be produced on the petrographic basis at Corfu (CorB17, CorB 18 and CorB 21) plot close to the raw materials and laboratory tests, while the other amphorae (CorB3, CorB6, CorB11, CorB13 and CorB21) plot distant from these and near the field of Sibari pottery.

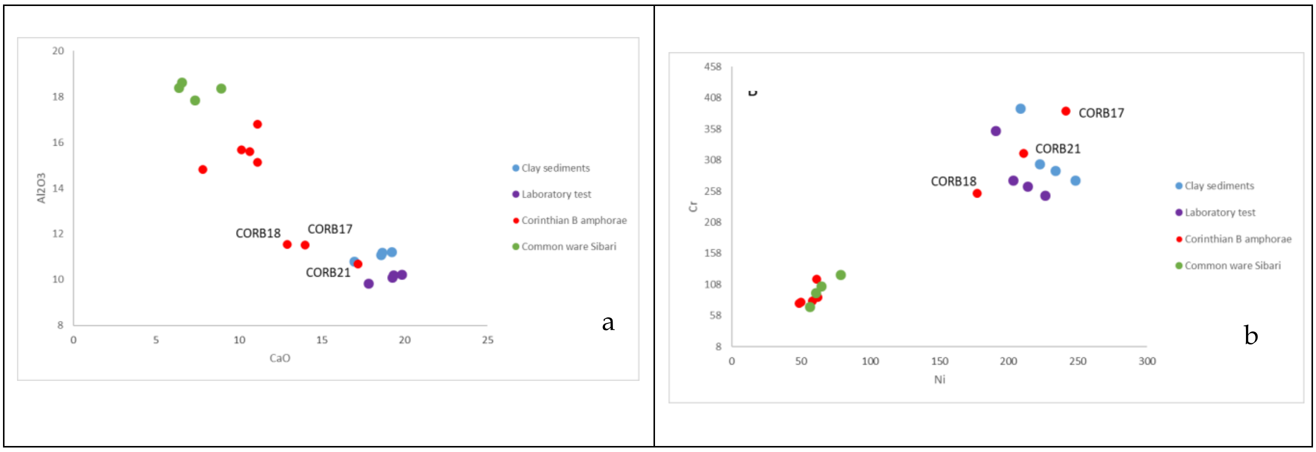


*Figure 6. (a) $Al_2O_3$wt% – CaOwt% diagram; (b) Cr ppm – Ni ppm diagram of considered samples.*

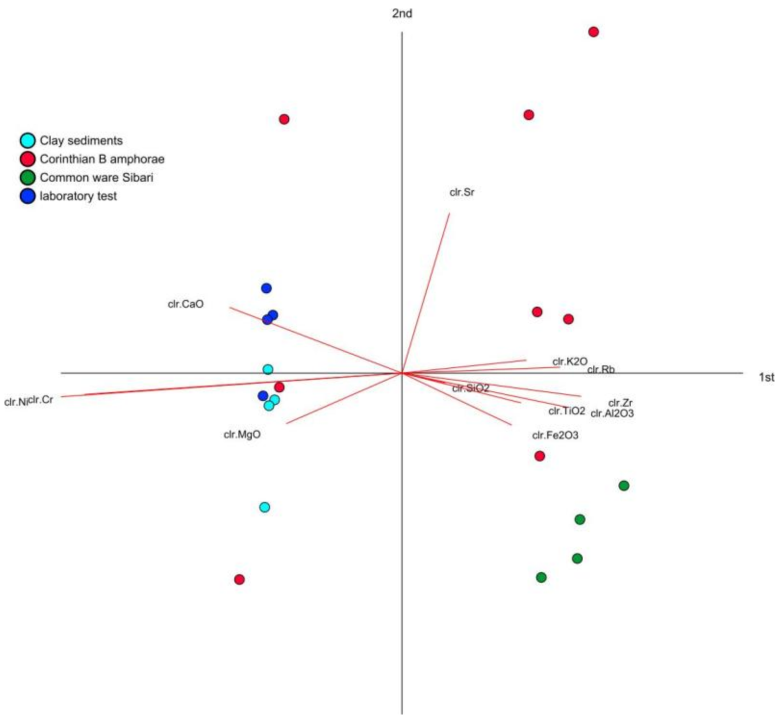


*Figure 7. Score and loading plot of PC1 and PC2 determined considering only the major elements, explaining the 89% of the total variance.*

***Table 3. Chemical composition of samples analysed in this study, expressed as wt% (major elements) and as ppm (trace elements).***

| | Sample | $SiO_2$ | $TiO_2$ | $Al_2O_3$ | $Fe_2O_3$ | MnO | MgO | CaO | $Na_2O$ | $K_2O$ | $P_2O_5$ | Sr | V | Cr | Co | Ni | Zn | Rb | Y | Zr | Nb | Ba | La | Ce | Pb | Th |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clayey Sediments | CORFU1A | 54.85 | 0.58 | 11.20 | 5.38 | 0.11 | 6.01 | 18.64 | 0.85 | 2.23 | 0.14 | 285 | 53 | 302 | 33 | 222 | 47 | 68 | 21 | 83 | 6 | 174 | 15 | 30 | 8 | 6 |
| | CORFU2A | 54.89 | 0.57 | 11.09 | 5.55 | 0.12 | 6.01 | 18.56 | 0.87 | 2.20 | 0.15 | 279 | 51 | 291 | 32 | 234 | 46 | 67 | 17 | 76 | 4 | 203 | 23 | 46 | 10 | 4 |
| | CORFU3A | 58.87 | 0.59 | 10.79 | 5.11 | 0.11 | 4.35 | 16.96 | 0.99 | 2.07 | 0.17 | 205 | 48 | 391 | 29 | 209 | 42 | 59 | 17 | 91 | 2 | 201 | 25 | 39 | 15 | 6 |
| | CORFU4A | 54.43 | 0.58 | 11.21 | 5.15 | 0.10 | 6.00 | 19.22 | 0.87 | 2.30 | 0.13 | 296 | 53 | 275 | 32 | 248 | 48 | 69 | 19 | 74 | 4 | 210 | 24 | 26 | 10 | 4 |
| Sandy Sediments | CORFU1S | 70.47 | 0.02 | 1.60 | 0.40 | 0.01 | 1.95 | 24.32 | 0.70 | 0.52 | 0.01 | 595 | 10 | 35 | 2 | 32 | 15 | 2 | 10 | 25 | 0 | 101 | 9 | 1 | 8 | 0 |
| | CORFU2S | 70.05 | 0.03 | 1.10 | 0.72 | 0.03 | 0.99 | 26.31 | 0.50 | 0.21 | 0.06 | 540 | 11 | 41 | 2 | 31 | 12 | 3 | 10 | 18 | 0 | 122 | 15 | 1 | 11 | 0 |
| | CORFU3S | 70.57 | 0.04 | 1.30 | 0.55 | 0.02 | 1.06 | 25.39 | 0.60 | 0.43 | 0.04 | 580 | 13 | 37 | 3 | 31 | 13 | 2 | 12 | 22 | 0 | 116 | 13 | 1 | 10 | 0 |
| Laboratory tests | CORFU1 | 57.17 | 0.72 | 13.53 | 7.13 | 0.13 | 5.52 | 13.30 | 0.67 | 1.57 | 0.27 | 175 | 39 | 387 | 42 | 281 | 52 | 21 | 12 | 75 | 0 | 296 | 26 | 43 | 21 | 0 |
| | CORFU3 | 56.91 | 0.69 | 13.30 | 7.66 | 0.13 | 5.92 | 12.33 | 1.09 | 1.52 | 0.45 | 242 | 69 | 418 | 39 | 301 | 42 | 30 | 21 | 92 | 1 | 275 | 26 | 55 | 504 | 13 |
| | CORFU4 | 61.44 | 0.59 | 11.89 | 5.97 | 0.11 | 4.46 | 12.68 | 0.71 | 1.77 | 0.38 | 232 | 37 | 312 | 31 | 224 | 54 | 47 | 19 | 94 | 4 | 308 | 16 | 41 | 22 | 5 |
| | CORFU7 | 67.74 | 0.61 | 11.56 | 5.78 | 0.12 | 3.05 | 8.50 | 0.69 | 1.62 | 0.34 | 119 | 44 | 266 | 31 | 198 | 48 | 68 | 10 | 76 | 1 | 279 | 23 | 50 | 42 | 6 |
| | CORFU8 | 57.43 | 0.64 | 12.61 | 6.32 | 0.10 | 4.97 | 15.62 | 0.48 | 1.59 | 0.23 | 210 | 43 | 372 | 35 | 260 | 41 | 30 | 21 | 89 | 1 | 273 | 22 | 50 | 24 | 8 |
| | CORFU9 | 51.93 | 0.52 | 10.72 | 4.62 | 0.13 | 4.44 | 24.90 | 0.57 | 2.03 | 0.14 | 287 | 33 | 209 | 26 | 184 | 40 | 48 | 16 | 77 | 3 | 244 | 23 | 34 | 9 | 3 |
| | CORFU10 | 57.76 | 0.59 | 11.60 | 5.82 | 0.11 | 4.70 | 15.97 | 1.02 | 2.24 | 0.19 | 282 | 50 | 339 | 35 | 231 | 56 | 71 | 20 | 92 | 2 | 268 | 24 | 46 | 13 | 6 |
| Archaic 'Corinthian B' amphorae found at Gela | CorB3 | 61.12 | 0.63 | 15.68 | 5.39 | 0.08 | 2.63 | 10.15 | 1.22 | 2.91 | 0.19 | 270 | 50 | 87 | 21 | 62 | 52 | 78 | 9 | 86 | 2 | 335 | 30 | 69 | 12 | 9 |
| | CorB6 | 60.30 | 0.65 | 15.15 | 5.27 | 0.11 | 2.38 | 11.1 | 1.43 | 3.20 | 0.41 | 538 | 55 | 77 | 24 | 49 | 53 | 89 | 20 | 129 | 6 | 583 | 31 | 73 | 19 | 5 |
| | CorB11 | 64.74 | 0.56 | 14.81 | 5.18 | 0.08 | 2.20 | 7.80 | 1.35 | 3.10 | 0.18 | 173 | 54 | 81 | 20 | 58 | 42 | 73 | 7 | 66 | 0 | 472 | 30 | 66 | 9 | 4 |
| | CorB13 | 56.36 | 0.89 | 16.8 | 6.92 | 0.14 | 3.28 | 11.11 | 1.50 | 2.68 | 0.32 | 600 | 87 | 117 | 30 | 61 | 65 | 64 | 10 | 96 | 8 | 515 | 47 | 87 | 16 | 2 |
| | CorB17 | 59.98 | 0.56 | 11.52 | 5.78 | 0.11 | 4.49 | 13.98 | 1.09 | 2.29 | 0.2 | 330 | 54 | 387 | 35 | 241 | 51 | 68 | 20 | 93 | 3 | 389 | 18 | 42 | 13 | 8 |
| | CorB18 | 61.68 | 0.52 | 11.55 | 5.10 | 0.09 | 4.73 | 12.92 | 1.67 | 1.61 | 0.14 | 166 | 50 | 254 | 20 | 177 | 44 | 22 | 5 | 41 | 0 | 316 | 19 | 27 | 1 | 0 |
| | CorB21 | 58.90 | 0.51 | 10.68 | 5.18 | 0.1 | 3.97 | 17.20 | 1.12 | 2.07 | 0.26 | 538 | 50 | 319 | 27 | 211 | 53 | 62 | 18 | 81 | 3 | 561 | 23 | 40 | 6 | 3 |
| | CorB22 | 60.96 | 0.62 | 15.59 | 5.31 | 0.09 | 2.51 | 10.66 | 1.47 | 2.61 | 0.17 | 255 | 58 | 79 | 20 | 50 | 55 | 78 | 19 | 117 | 5 | 387 | 32 | 41 | 20 | 8 |
| Common wares and tiles from Sibari | SIB 5 | 54.09 | 0.90 | 18.37 | 8.82 | 0.19 | 4.85 | 8.92 | 1.21 | 2.40 | 0.24 | 261 | 116 | 124 | 23 | 79 | 104 | 96 | 31 | 181 | 19 | 492 | 28 | 93 | 19 | 16 |
| | SIB 12 | 58.23 | 0.81 | 18.62 | 7.91 | 0.15 | 3.65 | 6.55 | 1.17 | 2.65 | 0.26 | 248 | 110 | 105 | 10 | 64 | 95 | 98 | 25 | 144 | 16 | 502 | 32 | 86 | 20 | 17 |
| | SIB 14 | 58.89 | 0.78 | 17.85 | 7.42 | 0.15 | 3.54 | 7.34 | 1.13 | 2.66 | 0.24 | 245 | 106 | 95 | 11 | 61 | 83 | 96 | 23 | 139 | 14 | 512 | 25 | 82 | 16 | 13 |
| | SIB 18 | 58.96 | 0.82 | 18.39 | 8.17 | 0.13 | 2.96 | 6.37 | 0.98 | 2.95 | 0.27 | 269 | 103 | 73 | 14 | 56 | 77 | 93 | 22 | 145 | 15 | 644 | 25 | 66 | 17 | 14 |

## 5. CONCLUSIONS

The present research started from the need to locate the production site, or sites, of a group of archaic 'Corinthian B' amphorae found in the archaeological excavations at Gela (Sicily). The issue on the provenance of the 'Corinthian B' amphorae has been largely debated in the archaeological literature and, on the basis of archaeological discoveries and archaeometric investigations, many scholars have proposed Corfu as one of the main production centres, active at least from the V to III century BC. In this scenario, this study focused mainly on the provenance analysis of archaic 'Corinthian B' amphorae from Gela and the analysis of the Corfu raw materials, possibly used for their production. The obtained data regarding the potential raw materials outcropping in the eastern coast of Corfu, have highlighted that the petrographic features of some of the 'Corinthian B' amphorae are very close to that of the raw materials and of the laboratory tests obtained adding 10% of coarse sand to the base clayey sediments. The results of chemical analysis have confirmed that part of the amphorae (CorB17, CorB18 and CorB21) found in Gela are of Corfu provenance. However, a more extensive sampling campaign on Ionian coasts will allow to better define the production area of this ceramic class.

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