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CHANGES IN THE SICILIAN GLASS ECONOMY BETWEEN THE 5TH AND 11TH CENTURIES: THE CASE OF VIA ROMANO AND VILLA DEL CASALE

Francesca Colangeli, Elisa Vagni, Nadine Schibille

ABSTRACT

In recent decades, increased research on post-Roman Sicily has made it possible to better understand the crucial role that the island played within the Mediterranean area both in the late Roman and medieval periods. The study of ceramics has revealed important manufacturing and commercial aspects that affected Sicily during this time. This research used glass as another indicator to investigate questions of production and circulation of commodities between the 5th and 11th centuries CE. In the context of two European Research Council research programmes ('Sicily in Transition' and 'GlassRoutes'), the first systematic study of Sicilian glass assemblages was conducted to explore their chrono-typological and compositional characteristics. The chronological arc includes the fundamental transformations of the ancient glass industry and the establishment of new glassmaking technologies in the Western Mediterranean and Europe. Combining the archaeological and analytical data, the temporal and geographical evolution of glass consumption and

supply within the island was defined, revealing how regime changes affected the availability of vitreous materials. More specifically, in order to highlight differences and similarities between different parts of the island through time, the results of the central-eastern rural site of Villa del Casale (Piazza Armerina – Enna Province) and the western city of Mazara del Vallo (Trapani Province) are compared. The analytical data from Mazara del Vallo illustrate a continuity in glass supply from the Levantine coast at least until the 7th century. Moreover, the typologies are consistent with those already published for the Western Mediterranean area. The Islamic conquest introduced new glassmaking techniques with possible local production of soda plant ash glass as early as the 9th/10th century. Furthermore, the typologies and analytical results point to the integration of Sicily into the wider Fatimid markets.

Keywords: Byzantine, Fatimid, plant ash glass, Islamisation, production, trade networks

INTRODUCTION

The period focused on in this research spans a broad chronological arc (from the 5th to the 11th century), encompassing the fundamental transformations of the ancient glass industry and the introduction of new glassmaking technologies in the Western Mediterranean and mainland Europe. During these centuries, Sicily was successively ruled by Byzantium, the Aghlabids, the Fatimids, the Kalbids and the Normans, laying the foundations for a multicultural, multi-religious and complex society.

In recent decades, increased research on post-Roman Sicily has shown that the island played a crucial role in the Mediterranean both in the late Roman and

medieval periods. The study of ceramics, coins and seals revealed important aspects of manufacturing and trade that affected Sicily during this time.¹ In contrast, few studies have focused on glass, especially during the Islamic period (mid-9th to mid-11th century). Within the framework of two European Research Council (ERC) research programmes ('Sicily in Transition' and 'GlassRoutes'),² the first systematic study of Sicilian glass assemblages was conducted to explore their chrono-typological and compositional characteristics. This paper specifically compares the results of the typological study of the central-eastern rural site of Villa del Casale (Piazza Armerina – Enna Province) with those of the Via Romano (Mazara del

¹ VACCARO 2013; SACCO 2018; MOLINARI 2019.

² ERC Advanced Grant 'The Archaeology of Regime Change: Sicily in Transition', directed by Martin Carver (York University) and Alessandra Molinari (Tor Vergata University of Rome). ERC 'GlassRoutes: Mapping the First Millennium Glass Economy', directed by Nadine Schibille (IRAMAT-CEB).

Vallo – Trapani Province) site on the west coast. This has led to a better understanding of the diachronic changes in the use and consumption of glass and has also highlighted the differences between the two contexts during the Islamic period. The archaeometric analyses of the material from the site of Via Romano made it possible to provide the first key evidence of the transition from natron-based glass production to that of plant ash.

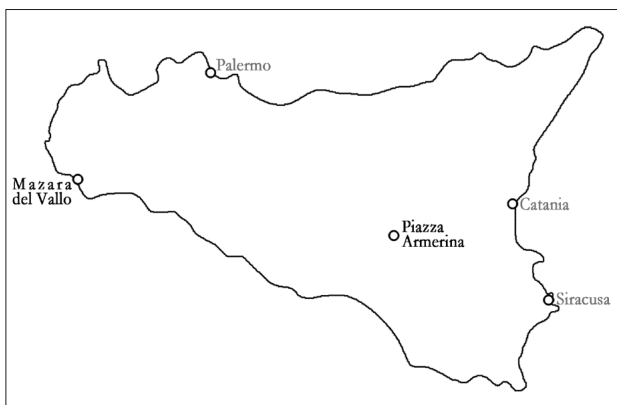


Fig. 1: Location of the city of Mazara del Vallo and the town of Piazza Armerina in Sicily in relation to the main cities on the island. © F. Colangeli

THE ARCHAEOLOGICAL CONTEXT

The city of Mazara del Vallo is located on the west coast of the island (Figure 1). Mazara’s urban centre has been the subject of limited archaeological research. Against this background, the emergency excavations on the Via Romano site carried out in 1997 by the AR.CO cooperative³ represented a first important step towards a better understanding of the city’s history.⁴ The site is located in the north-eastern part of the historic centre of Mazara del Vallo (Figure 2a). The excavations were carried out for the construction of an underground car park and brought to light an area with significant archaeological potential that included a series of structures and frequentation layers covering a time span from the Byzantine period to the modern era. The first traces of occupation of the site date to the late 7th century and can be traced back to the construction and use of a building.⁵ This was followed by a phase of abandonment during the 8th and 9th centuries. During the Islamic period, the most clearly documented phases range from the mid-10th to mid-11th century and are related to the construction and filling of variously shaped cuts in the rock, which can be identified as latrines, cesspits, dumps, wells and storage pits (Figure 2b).⁶



Fig. 2: (a) Location of the Via Romano excavation within the city of Mazara del Vallo. © F. Colangeli. (b) Picture of the excavated area. © AR.CO Cooperative

³ MEO 2021.

⁴ MOLINARI and MEO 2021.

⁵ MEO 2021, phase 1–2, Building 1.

⁶ *Ibid.*, phase 3–6.

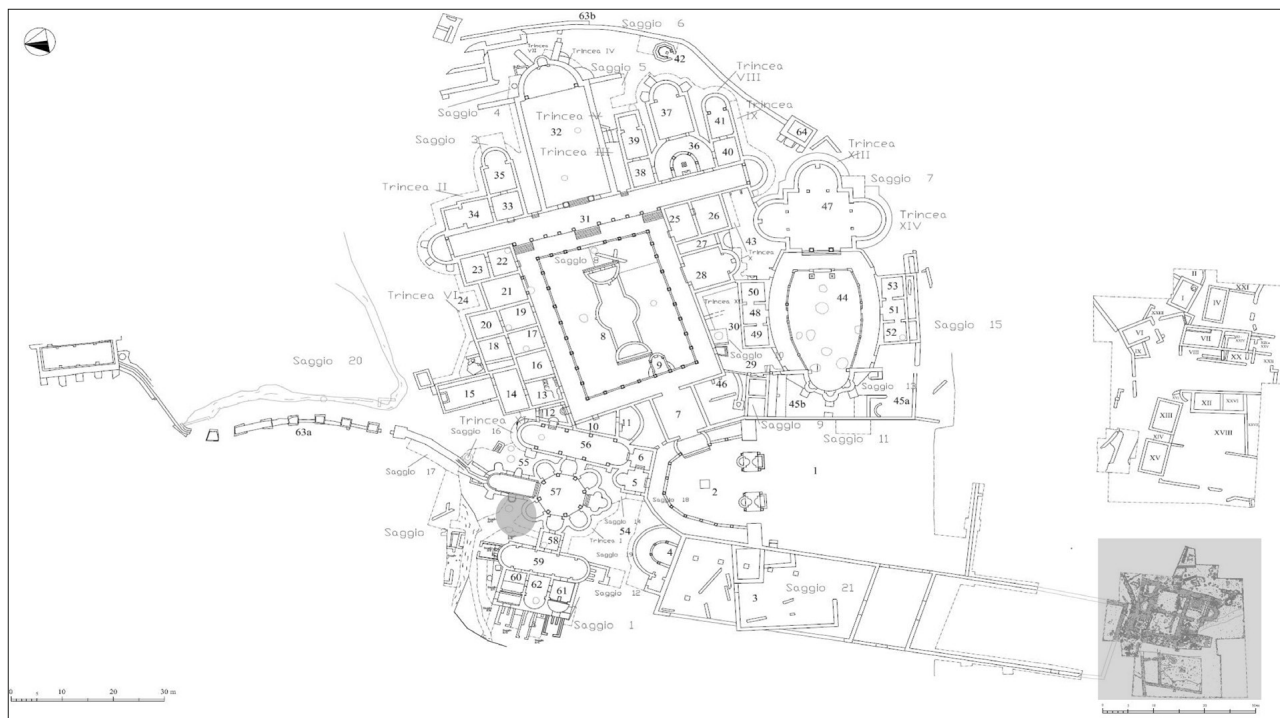


Fig. 3: Layout of the Villa del Casale. In grey are the areas of provenance of the glass studied. Re-work from PENSABENE 2016 (226, fig. 3)

The Villa del Casale in central Sicily was built in its most magnificent form at the beginning of the 4th century.⁷ Partially abandoned, converted and reoccupied first in the 5th and then in the 6th century,⁸ evidence of its use between the 7th and 9th centuries is attested to by the sporadic finds of pottery sherds recovered during the various excavation campaigns since the 1950s.⁹ During the 10th century, an Islamic settlement was established on top of the Villa, which was abandoned two centuries later.¹⁰ The glass finds shown here were recovered during the excavation campaign conducted by Sapienza Università di Roma over the last 10 years under the direction of Patrizio Pensabene and Paolo Barresi. Specifically, the finds come from two distinct contexts: two wells located near the main baths of the villa (Figure 3) and the so-called Southern Baths complex (Figure 3). Glass objects from the main area date from the mid-10th to mid-11th century, while different occupation phases were preserved

in the Southern Baths. The glassware studied for the present paper was recovered from two different reoccupation phases of the complex, dated between the second half of the 5th and the second half of the 6th century, as well as from the medieval settlement contemporary to the occupation of the main area (mid-10th to mid-11th century).

GLASS TYPES

Twenty-five glass objects associated with lamps and tableware were found in the layers corresponding to the period of reoccupation of the Villa del Casale during late antiquity.¹¹ The most representative typology verified from this period is the Isings 106 (C variant) conical beaker/lamp with an everted fire-rounded rim and concave base. This type of glass object can also feature a mould-blown decoration (Figure 4, no. 13). Among the lamps there is also an Isings 134 or Uboldi I.1, namely a three-handled specimen with a banded

⁷ On the excavation data, see PENSABENE 2016; PENSABENE and BARRESI 2019.

⁸ CARLONI and PIAY AUGUSTO 2019, 451; MURATORE 2019.

⁹ ALFANO 2019, 600.

¹⁰ ALFANO, ARRABITO, and BUSCEMI 2019; ARRABITO 2019; CARLONI and VENTURA 2019. On the causes for the abandonment, see PENSABENE 2010, 19–20.

¹¹ The study was conducted by E. Vagni as part of a master's degree thesis entitled 'The glass economy of a rural late antique site: The case of the Villa del Casale di Piazza Armerina (mid-4th–6th century)'.

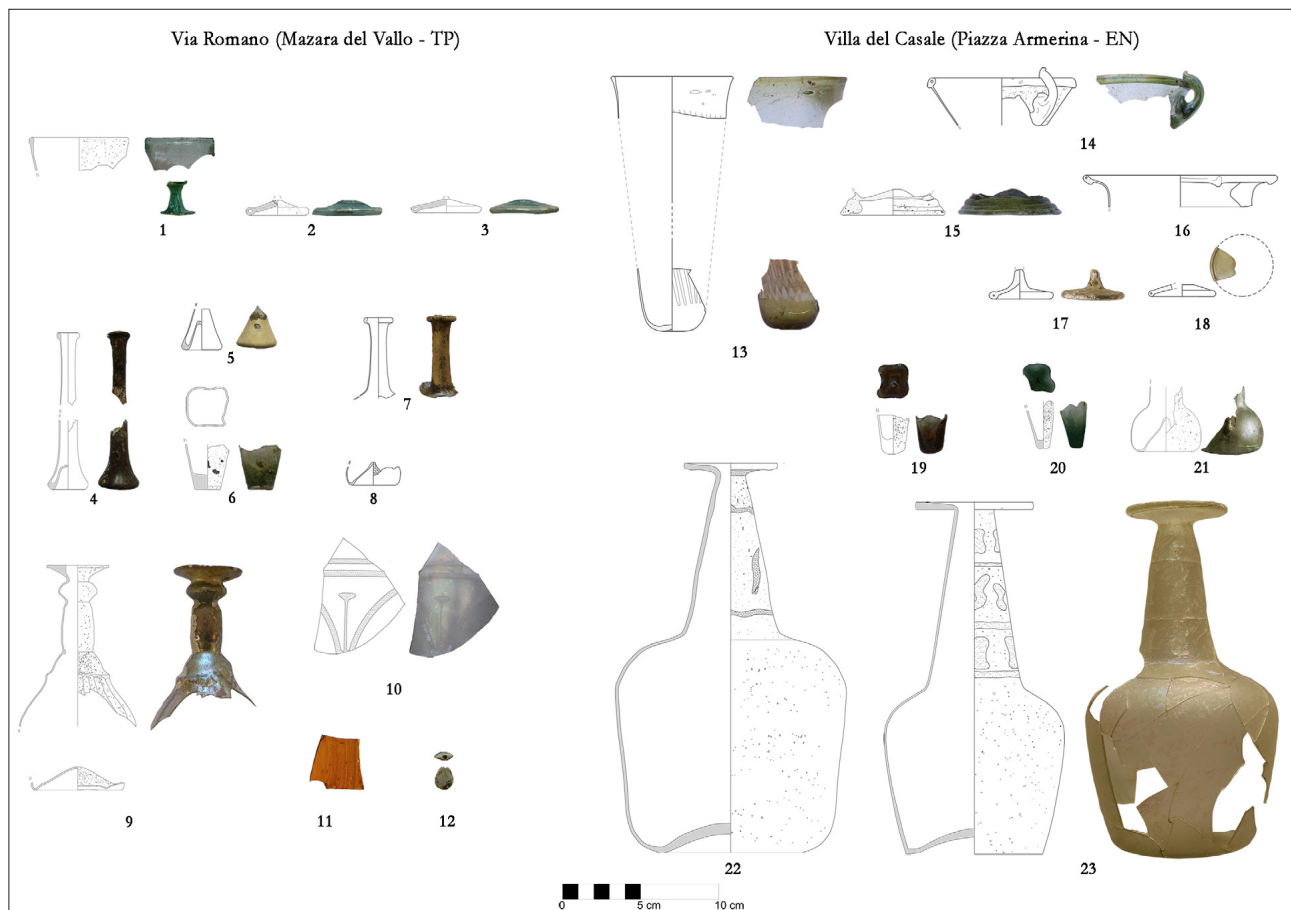


Fig. 4: Principal types of glass vessel found at the Via Romano and Villa del Casale sites from between the 5th and 11th centuries. © F. Colangeli and E. Vagni

rim (Figure 4, no. 14)¹² used in the Italian peninsula over a wide time frame (late 4th–8th century).¹³

As far as tableware is concerned, fragments of feet formed by an overlapping filament were found (Figure 4, no. 15). These objects were made by applying a single rotating thread and were widespread throughout the eastern Mediterranean from the 4th century onwards¹⁴ and the Western Mediterranean from a century later.¹⁵ In Italy, several studies on late Roman vitreous materials have shown an almost uniform presence of this type of object in 5th-century

contexts, and as a result it is considered an important guide fossil.¹⁶ They are usually related to bowls or bottles.¹⁷ Unfortunately the fragments from the Villa del Casale do not allow a reconstruction of the original shape, so both possibilities are equally valid. Among the late Roman glass finds recovered from the Villa, an uncommon type was also identified. It was characterised by a pinched rim probably related to a cup (Figure 4, no. 16).¹⁸ The object was recorded in a mid-4th- to mid-5th-century context and shows close similarities with specimens from Rome and Ostia.¹⁹ Sixth-century Isings type 111 goblets were also found

¹² UBOLDI 1995, 104–108, fig. 2, type I.1, no. 5.

¹³ *Ibid.*, 105.

¹⁴ GORIN-ROSEN 2020, 156, fig. 7, nos. 1–7; WINTER 2020, 590, fig. 1, no. 5.

¹⁵ FOY 1995, 225, pl. 7, nos. 40–44; FOY 2003, 72, nos. 41–43; FOY 2016a, 112, fig. 15, nos. 114–115.

¹⁶ SAGUI 1993, 120, fig. 5, nos. 21–24 (Rome, Crypta Balbi); STERNINI 1995, 283, fig. 15, nos. 188–200 (Rome, Palatine Hill); GIANNETTI, GLIOZZO, and TURCHIANO 2015, 294, tav. 1, no. 23–28 (Herdonia); DEL VECCHIO 2010, 84, fig. 4, no. 5 (Naples).

¹⁷ See, respectively, SAGUI 1993, 118 and DE MITRI and GIARDINO 2021, 19, fig. 18, no. 4; FOY 2016b, 2, fig. 1, no. 1; BUORA 2004, 189, no. 447.

¹⁸ See VAGNI in this volume.

¹⁹ STERNINI 1995, 274, fig. 6, nos. 33–34 (Rome, Palatine Hill); STERNINI 2017, 140, fig. 12, no. 38 (Basilica di Pianabella).

at the Villa del Casale²⁰ (Figure 4, nos. 17–18). Two variants, yellow in colour, were discovered, both having gone through either one or two production stages. This means that the stems could have been made from a single glass piece by pulling one end, or that they could have been applied to the already formed cup.

Isings 111 goblets were also recovered from the Via Romano site at Mazara. Only ten finds, of a light blue-green colour, were retrieved from the layers dated between the late 7th and early 8th centuries (Figure 4, no. 1–3). The recovered stems indicate that these goblets were produced in two working phases. Comparison with Tunisian contexts revealed similarities between the Mazara specimens and the type C identified by Danièle Foy.²¹ Compared to the earlier types, these are characterised by a smaller and thinner stem, often constricted in the centre, and made of a blueish glass.²² Moreover, this type has been found at the Nabeul, Sidi Jdidi and Oued R'mel sites in layers dating to the mid/late 7th century,²³ hence contemporary to the Via Romano finds.

The Islamic glass from both Via Romano and Villa del Casale dates from the mid-10th to the mid-11th century, the period of the Emirate of Sicily under the Calbid dynasty that was politically linked to the Fatimid Caliphate. A total of 36 and 76 glass finds were identified, respectively, and they are mainly related to small vessel forms. Most of the finds are for cosmetic, medical and chemical purposes such as small perfume bottles. In Via Romano, this category is mainly represented by small flasks with a truncated cone profile (Figure 4, no. 4–5), a rim diameter of 1.5 cm and a bottom diameter of 2–2.5 cm. In contrast, most of the small perfume bottles from Villa del Casale have a globular body (Figure 4, no. 21), a rim diameter of 1.5–2 cm and a bottom diameter of

2–4 cm. However, both types have been identified at both sites alongside small square-section bottles with pinched sides (Figure 4, no. 6 and 19–20).²⁴

Tableware is also documented, often decorated using mould-blowing or engraving techniques (Figure 4, nos. 9–10 and 22–23). A beaker from Mazara, for example, is engraved with an arch and column decorative motif similar to that found in the Serçe Limani shipwreck²⁵ (Figure 4, no. 10). The same decorative technique appears on four mallet-shaped bottles recovered both in the Central area and in the Southern Baths complex of the Villa del Casale. These bottles are characterised by a disk rim and a truncated cone neck (Figure 4, no. 22–23). Disk rim bottles are found throughout the Islamic world both in mallet-shaped or pinched waist versions.²⁶ As Danièle Foy has recently pointed out, the decoration can vary from geometric to figurative patterns, involving the entire body or limited to the neck area.²⁷ This second option is visible in the bottles found at the Villa del Casale. Lastly, from Mazara, in addition to vessels, coloured architectural glass originally inserted in stucco panels was also recovered (Figure 4, no. 11).²⁸

To summarise, the majority of the 10th–11th century objects examined here find analogies with material recovered at Şabra al-Manşūriyya (Ifriqiya) and also in Egypt, al-Andalus and the Levantine area.²⁹ Therefore, the glass typologies circulating in Sicily were largely consistent with those known from other Islamic regions and markedly different from the contemporary archaeological record in the Italian peninsula.

ANALYSIS OF THE VIA ROMANO FINDS

Almost the entire assemblage from the Via Romano site dating from the 7th to the 11th century was

²⁰ Goblets were found in the alluvial layers dating to the 6th-century occupation. They were absent during the previous phase. On the stratigraphic information, see MURATORE 2019, 411–412.

²¹ FOY 2003, 74 and 77, figs. 64–72.

²² *Ibid.*

²³ *Ibid.*

²⁴ These typologies have already been identified at Şabra al-Manşūriyya (Ifriqiya). See, respectively, FOY 2020, Sb3, Sb2, 65–67 and Sb14, 77 and 79, fig. 32.

²⁵ KITSON and MACK 2009, 44, figs. 4–3, BK17.

²⁶ FOY 2020, 85–96.

²⁷ *Ibid.*

²⁸ They have already been identified in Şabra al-Manşūriyya, where their better preservation allowed to understand that they were inserted in stucco panels; see FOY 2020, 195–234.

²⁹ For instance, mallet-shaped bottles have been found in Şabra al-Manşūriyya, Fustat, Pechina and in the Serçe Limani shipwreck. For a synthesis see FOY 2020, Sb22, 85–98 with references.

analysed by laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) at the Centre Ernest Babelon in Orléans (IRAMAT, UMR 7065 – CNRS – Université d'Orléans).³⁰ The group consists of a total of 32 items: 8 goblets from the late 7th to early 8th century and 24 mid-10th to 11th-century objects used exclusively for medicinal purposes, cosmetics and as tableware, with the exception of a single bead (Figure 4, no.12).

The analysed samples could be classified according to three different glassmaking recipes depending on the fluxing agents. The magnesia and potash levels along with soda contents allowed 8 natron, 23 soda plant ash and 1 soda-ash high lead glass to be identified (Figure 5). Both the natron and soda plant ash groups have high soda levels but varied in terms of magnesium and potassium content, which was considerably higher for the plant ash glass.³¹ Only a single bead had a soda-ash high-lead composition characterised by a mix of soda ash glass (or raw ingredients) and lead oxide.³²

As for the natron-based glass, biplots for $\text{Fe}_2\text{O}_3/\text{TiO}_2$ and $\text{Fe}_2\text{O}_3/\text{Al}_2\text{O}_3$ (Figure 6a) were used to distinguish the source of the sand, as the major base glass elements are related to the sand's mineralogy.³³ In particular, it has been observed that Egyptian sand tends to have high concentrations of heavy minerals,³⁴ whereas Levantine sand is characterised by high alumina and lime concentrations and low heavy mineral content.³⁵ All of the Via Romano samples were consistent with a Levantine origin. They were characterised by fairly high alumina content ($\text{Al}_2\text{O}_3 \sim 3.2\%$), very low titanium ($\text{TiO}_2 \sim 0.07\%$), iron ($\text{Fe}_2\text{O}_3 \sim 0.41\%$) and zirconium ($\text{Zr} \sim 37$ ppm), while manganese was present exclusively at levels that can be attributed to natural impurities in the sand ($\text{Mn} < 200$ ppm).³⁶ More precisely, these features are compatible with the

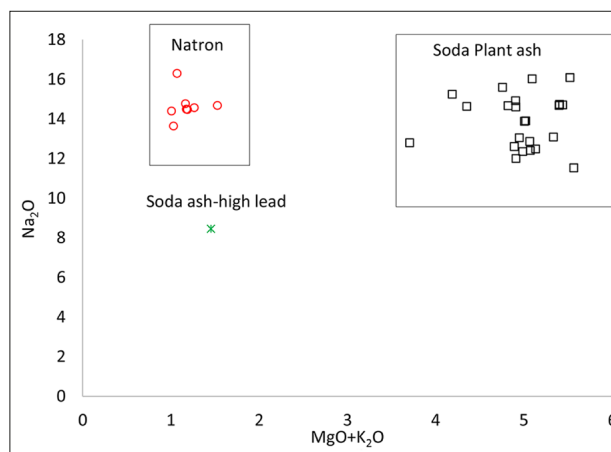


Fig. 5: The different fluxing agents were identified as $\text{MgO}+\text{K}_2\text{O}$ and Na_2O . © F. Colangeli

compositional group originally named Levantine I, defined on the basis of glass remains from the primary glassworks of Apollonia (Arsuf, Israel) dating from the 6th and 7th centuries.³⁷

Finally, with regard to soda plant ash glass, comparing the currently analysed samples with other known Islamic glass groups, it was evident that most of the Sicilian glass was different from Mesopotamian, eastern Mediterranean and Iberian plant ash glass with the exception of one object associated with glass produced on the Levantine coast (the engraved beaker) (Figure 6b). This is particularly reflected in the elements related to the silica source and heavy element levels, such as titanium, zirconium and thorium.³⁸

Finally, the composition of the bead with high levels of lead resembled soda ash lead from the Iberian Peninsula, first identified in Cordoba³⁹ and subsequently at various 10th–11th-century Iberian sites.⁴⁰ However, this attribution is not certain as the bead had somewhat higher soda and lead content, while magnesium, potassium and chlorine levels were

³⁰ For a more specific and comprehensive discussion of the results of the analyses, see SCHIBILLE and COLANGELI 2021.

³¹ SAYRE and SMITH 1961.

³² DE JUAN ARES and SCHIBILLE 2017, 14.

³³ CEGLIA et al. 2015, 215.

³⁴ FOY et al. 2003; FREESTONE et al. 2018, 167 with references.

³⁵ PHELPS et al. 2016, 60.

³⁶ SCHIBILLE and COLANGELI 2021.

³⁷ FREESTONE, GORIN-ROSEN, and HUGHES 2000; FREESTONE, JACKSON-TAL, and TAL 2008; BREMS et al. 2018. For more information on the detection of Apollonia-type glass in the Via Romano samples, see SCHIBILLE and COLANGELI, 2021, 492–493.

³⁸ SCHIBILLE and COLANGELI 2021, 494.

³⁹ DUCKWORTH et al. 2015

⁴⁰ DE JUAN ARES and SCHIBILLE 2020, 50. On the characteristics of this glass type, see DE JUAN ARES and SCHIBILLE 2017; SCHIBILLE et al. 2020.

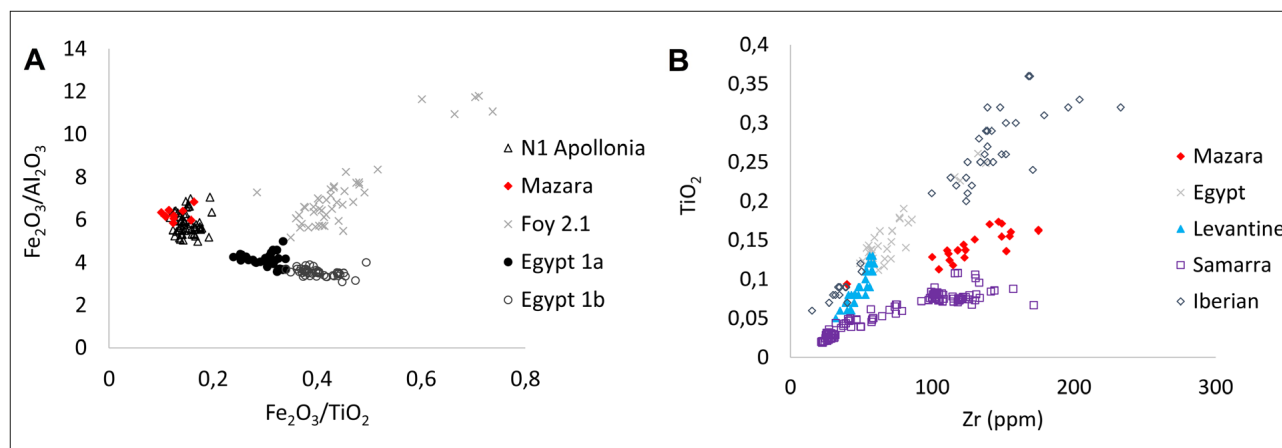


Fig. 6: Compositional characteristics of the natron (left) and soda ash type (right) glass from Mazara. (a) The different Fe₂O₃/TiO₂ and Fe₂O₃/Al₂O₃ composition highlights the differences in the heavy elements and clearly identifies the Mazara samples as Levantine glass. Data sources: FOY, PICON, and VICHY 2003 (Foy 2.1); PHELPS et al. 2016 (N1 – Apollonia); SCHIBILLE et al. 2019 (Egypt 1). (b) Comparison of the Mazara soda plant ash glass with published data on early Islamic glass assemblages from the Mesopotamia, Levant, Egypt and the Iberian Peninsula. Zirconium and titanium content reflect the silica source and highlight the compositional differences of the Mazara samples. Data sources: SCHIBILLE et al. 2019 (Egypt); SCHIBILLE et al. 2018 (Samarra); PHELPS 2018 (Levantine – Ramla); DE JUAN ARES and SCHIBILLE 2017 (Spain). © F. Colangeli

significantly lower than in typical Iberian soda-ash lead glass.⁴¹

CONCLUSION

In summary, the glass typologies documented at the Villa del Casale between the 4th and 5th centuries were widespread in the Mediterranean area during late antiquity and comparable to finds in other Italian contexts such as Rome, Ostia, Naples, Aquileia and Herdonia. Goblets only appear in the reoccupation phases of the Villa in the 6th century. In the 7th-century Via Romano context, only goblets have been recorded. However, their composition of essentially pristine Apollonia-type glass suggest that fresh Levantine glass continued to reach the island until the end of the 7th century.

Unfortunately, neither of these contexts has preserved 8th- and 9th-century layers, a period of great political and economic change in Sicily. The rupture between the Roman Church and the Byzantine Empire and the

final Islamic conquest of North Africa seem to have had a significant impact on the social and economic complexities of the island.⁴² The gradual ‘conquest’ of the island by the Aghlabids in the 9th century must also be included in the picture.⁴³ Finally, from an archaeological point of view, knowledge of the material culture of Sicily for this period is still quite limited, even if new data is emerging.⁴⁴

Glass from the Calbid period (mid-10th to mid-11th century) shows the effects of the Islamisation of the island.⁴⁵ This phenomenon can be seen in both the typology and composition. From a typological point of view, the glass from this period is consistent with that from other Islamic regions. It also reflects certain habits and customs, such as the preponderance of phials for medical and cosmetic use. In addition, the Islamic conquest introduced new glassmaking and glassworking techniques with a possible local production of soda plant ash glass as early as the 10th century. Finally, the identification of Levantine

⁴¹ SCHIBILLE 2022.

⁴² For an overview, see MOLINARI 2019.

⁴³ On the use of this term, see NEF and PRIGENT 2013.

⁴⁴ The archaeological investigations for this period have focused mainly on the eastern centres. On this topic, see ARCIFA et al. 2020 and CACCIAGUERRA 2018. For an overview of the economic complexity of Sicily between the 8th and 9th centuries, see VACCARO 2013 and MOLINARI 2019, 102–103.

⁴⁵ The term ‘Islamisation’ refers to the set of common political, linguistic, religious, economic, cultural and social elements introduced following integration into the Islamic world. Here, the word is used mainly in socio-cultural terms. On this subject, see PEACOCK 2017 and NEF 2021, 207.

soda ash glass and Iberian soda-ash high lead glass also suggests the presence of imports.

This study was of course only the first step in researching Sicilian glass, but the data shows substantial novelties in the transition from natron to plant ash-based production, with important implications for glassmaking in Sicily and the Italian Peninsula.

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