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Research Article

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Archaeometric Characterization of Obsidian Artifacts at Casa dei Francesi (Ustica Island, Italy) and Clues of a Hidden Prehistoric Settlement

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Abstract: At Ustica island (Palermo, Italy), in the area of Casa dei Francesi, 119 fragments of obsidian artifacts were collected on the surface of an agricultural field at an altitude of 50 m asl. In the same area, until now, scientific literature reports only the presence of late Roman pottery (4^{th}–6^{th} centuries AD), and no evidence has appeared that it could be the site of a prehistoric settlement. The most important prehistoric settlement, the Faraglioni Village (Middle Bronze Age) is located 700 m further north, overlooking the sea. Obsidian provenance analyses, performed on the 119 samples with absolutely non-destructive techniques WD-XRF and SEM-EDS, indicate two sources areas: Lipari (93 samples, 78%) and Pantelleria (26 samples, 22%). Concerning the obsidians from the island of Pantelleria, it was possible to also establish the sub-source of Salto la Vecchia. The typological and functional analyses of the 119 obsidian fragments point out that 115 are debitages, some of which show evidence of percussion bulbs, and only 4 are tools with micro-retouching. This work focuses on the geochemical and typological characterization of the obsidian assemblage collected, the characteristics of which suggest the existence of a prehistoric settlement in the area of the Casa dei Francesi or nearby.

Keywords: Obsidian provenance, Ustica Italy, Archaeometry, SEM-EDS, WD-XRF, non-destructive analyses.

1 Introduction

The island of Ustica, located in the Southern Tyrrhenian Sea, about 70 km north of Palermo (Sicily, Italy; Figure 1), is the small top of a big volcanic submarine mount. The island, with a surface of 8.6 km^2 inside a perimeter of about 16 km, is considered to be an extinct volcanic complex since it has been inactive for over 130 ka (de Vita, 1993; de Vita, Laurenzi, Orsi, & Voltaggio, 1998; Foresta Martin, 2014; de Vita & Foresta Martin, 2017).

This paper presents the results of an archaeometric research carried out on 119 fragments of obsidian collected on the surface of an agricultural area of the island of Ustica known as Casa dei Francesi (French House), in the district of Tramontana Sopravia, at an altitude of 50 m asl (north-eastern quadrant of the island, Figure 1). The set of obsidian

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fragments is now preserved in the Laboratorio Museo di Scienze della Terra, at Ustica. The Tramontana area where Casa dei Francesi is located is well known from an archaeological point of view because it returns abundant fragments of late Roman ceramics datable between the 4th and 6th centuries AD (Spatafora & Mannino, 2008; Mannino & Ailara, 2016). Until now, no evidence of prehistoric settlements in this specific area had come to light.

The abundant obsidian finds are the unexpected result of a surface collection organized by the first author of this paper as part of an educational scientific program for Ustica middle school students. The school program established that the students, with the assistance of the teachers, had to collect some obsidian fragments in the agricultural area of eastern Tramontana, where the owners had reported the sporadic presence of small flakes emerging from the ground. The finds would then have been the object of study in the classroom, to understand its use during prehistory and attempt to establish its provenance from the mere visual characteristics of the glasses. During the surface collection, it was a surprise to note that instead of a dozen flakes that they thought were going to be found, over a hundred were picked up by students in less than an hour; which revealed the unusual concentration of obsidians in this part of the island. Hence the decision of the authors of this paper to perform typological and geochemical analyzes of all the obsidian finds and establish their function and origin.

Given the circumstances described, the collection of the obsidians was not carried out via systematic fieldwalking typical of an archaeological survey. The present study is therefore limited to the geochemical characterization and provenancing of the artifacts and their typological analysis. The results of these analyses suggest future archaeological investigations and excavation in the agricultural fields of Casa dei Francesi to explain the significance of the abundant obsidian finds in an area hitherto reported by the scientific literature only for the presence of late Roman ceramics.

Figure 1: Satellite view of Ustica Island (Sicily, Italy) with the main prehistoric settlements so far identified. The obsidian fragments analyzed in this work were collected on the surface of an agricultural field near Casa dei Francesi, in the eastern side of the vast Tramontana Plain, where any prehistoric site has been reported until now (modified from Google Earth).

2 Study Area

2.1 Geological Background

The island of Ustica, located about 70 km north of the Sicily coast and 160 km west of the Aeolian arc, is the emerging summit of a volcanic seamount that rises more than 2,000 m from the bottom of the Tyrrhenian Sea. The island covers an area of 8,6 km^2 and reaches a maximum elevation of 248 m asl at the central peak of Monte Guardia dei Turchi. It is mainly composed of volcanic rocks and subordinately of marine and continental sedimentary deposits. The Ustica volcanics have a Na-alkaline affinity, ranging in composition from alkali-basalts to alkali-trachyte (Cinque, Civetta, Orsi, & Peccerillo, 1988; de Vita, 1993; de Vita et al., 1998; Foresta Martin, 2014; de Vita & Foresta Martin, 2017).

The origin of Ustica volcanism is related to the activation of deep faults that accompanied the anticlockwise rotation of the Italian peninsula and the opening of the Tyrrhenian basin in the course of the complex interaction between the African and Eurasian plates (de Vita, Guzzetta, & Orsi, 1995). A Pleistocene age has been assumed for the birth of the Ustica volcanic complex (Barberi & Innocenti, 1980), around 1 Ma ago. Afterward, in the Middle Pleistocene, the seamount grew, bringing out its summit on the sea-surface, about 520 ka. Stratigraphic and geochronological studies testify that the exposed rocks were formed between 750 and 130 ka (de Vita et al., 1998; de Vita & Foresta Martin, 2017).

The trachytic eruption of Grotte del Lapillo Tephra (425 ka) represents the only silica-rich volcanic unit of the island that could have generated obsidianaceus rocks; however geological obsidian outcrops have never been reported among the Ustica volcanics (Romano & Sturiale, 1971; Cinque et al., 1988; de Vita, 1993; Bellia, Hauser, & Rotolo, 2000). Therefore, all the abundant obsidian artifacts found on Ustica do not derive from local geological outcrops but were imported from distant sources in prehistoric times (Foresta Martin, Di Piazza, D'Oriano, Carapezza, Paonita, Rotolo, & Sagnotti, 2016, 2017; Foresta Martin & La Monica 2019).

The island's volcanic activity ended at around 130 ka, with the explosive Falconiera phreatomagmatic eruption and the formation of an asymmetric tuff cone, which is the most easily recognizable Ustica volcanic edifice (de Vita & Foresta Martin, 2017).

2.2 Archaeological and Historical Background

Prehistory seems to have been a period of intense occupation of the island of Ustica. Evidence of prehistoric settlements can be found in almost the whole island in the form of abundant ceramic finds, obsidian splinters and tools imported from Lipari and Pantelleria (since the volcanism of Ustica did not generate volcanic glasses), lava-millstones, and remains of huts, the latter in the sites where excavations have been made (Spatafora & Mannino, 2008; Spatafora, 2009; Mannino & Ailara, 2016; Tykot, 1995; Foresta Martin & La Monica, 2019; Foresta Martin & Tykot, 2019). Here we present a brief review of the most relevant prehistoric and historic human settlements on the island of Ustica, to illustrate the wider context in which our study of the Casa dei Francesi obsidian has been developed.

The first colonization of the island of Ustica took place during the Neolithic, around the 6th millennium BC, as demonstrated by the discovery of ceramic and lithic finds on Pirozza, a hill overlooking the sea near Punta Spalmatore on the south-western side of the island (Mannino, 1998) (Figure 1). The stylistic analysis of ceramic fragments attributed to the facies of Stentinello, Tricromico, and Diana, suggests that this settlement was founded by colonizers from the Palermo coast where the same ceramic production is attested (Mannino, 1998). Recent analyses carried out on numerous obsidian fragments found in the Pirozza hill (Foresta Martin & Tykot, 2019) attest to the import of Lipari and Pantelleria obsidian after the first colonization of Ustica Island. In the same area of Spalmatore, the human occupation seems to have continued without interruption until the Bronze Age (Mannino, 1998; Mannino & Ailara 2016).

Neolithic and Eneolithic horizons (4th–3rd millennium BC) have been found also at Piano dei Cardoni, on the south-eastern side of the island; the Early Bronze Age (3rd–2nd millennium BC) at the central hill called Culunnella (238 m asl), and the Middle Bronze Age (14th–13th century BC) at Villaggio dei Faraglioni (~20 m asl), which represents the largest and richest prehistoric settlement brought to light so far (Spatafora & Mannino, 2008; Spatafora, 2009; Dawson, 2014; Mannino & Ailara, 2016; Spatafora, 2016; Speciale, Freund, de Vita, Larosa, Battaglia, Tykot, & Vassallo, 2020), (Figure 1). After the sudden and still unexplained abandonment of the Faraglioni Middle Bronze Age Village around 1200 BC, Ustica remained uninhabited for many centuries. Between the 4th and 3rd century BC, during the Hellenistic-Roman age,

Figure 2: Aerial view of Casa dei Francesi area at Tramontana, Ustica. The red ellipse indicates the agricultural fields where abundant obsidian fragments were collected (modified from Google Earth).

there is evidence of the re-colonization of the island. A big settlement with a nearby necropolis flourished on the Rocca della Falconiera, the top of an extinct tuff cone-volcano, 157 m asl located on the eastern corner of the island (Spatafora & Mannino, 2008; Spatafora, 2009; Mannino & Ailara, 2016).

In the late-Roman and Byzantine Age, it seems that a more widespread occupation of the island has occurred, as evidenced by the ruins of villages and by the abundance of ceramic finds dating from the 5th to the 6th century AD, scattered in the Petriera, Tramontana, and Spalmatore areas (Spatafora & Mannino, 2008; Spatafora, 2009; Mannino & Ailara, 2016).

Casa dei Francesi, where the set of obsidian analyzed in this work was collected, is a farmhouse located on the eastern side of the Tramontana plain (38°42’44” N; 13°11’09” E), (Figures 1 and 2). The nearest prehistoric settlements to Casa dei Francesi are two: one is a small village of the Ancient Bronze Age called Culunella, located on a hill at about 600 m southward; the other is the most important prehistoric settlement of Ustica called Villaggio dei Faraglioni, a village of the Middle Bronze Age located 700 m further north, on a high cliff overlooking the sea (Spatafora and Mannino, 2008; Spatafora, 2009; Mannino & Ailara, 2016) (Figure 1). In the lands of Casa dei Francesi, as well as in the wider Tramontana area, the archaeological literature has indicated the presence of abundant fragments of late Roman pottery, in particular of achromic pottery, and African *sigillata* (Spatafora and Mannino, 2008; Spatafora, 2009; Mannino & Ailara, 2016). Conversely, so far, there is no report of prehistoric ceramic finds that can be associated with the presence of obsidian fragments.

Around the 7th and 8th centuries, the political instability of Sicily and the insecurity of the maritime routes caused a decrease in the population of Ustica. The island remained deserted for about four centuries until the second half of the 1200s when the Normans decided to establish a Benedictine monastery at Case Vecchie, associated with a small agro-pastoral community. The settlement survived for about two centuries until the second half of the 15th century when the island of Ustica was occupied by the North African corsairs, who transformed it into a base to launch their incursions along the maritime routes between Sicily and the continent. The last colonization of the island of Ustica, from which the current population descends, was promoted by the Bourbons in the second half of the 1700s, to remove the dominant North African corsairs from the island (Ailara, 2015).

3 Materials and Methods

3.1 Geochemical Analyses

Obsidian provenances can be determined using many partially destructive or non-destructive analytical techniques (Acquafredda, Larocca, Minelli, Pallara, & Micheletti, 2020, and references therein). Among the absolutely non-destructive techniques, energy dispersive and wavelength dispersive X-ray fluorescence (ED and WD XRF) has been tested and used for over 30 years, in many research laboratories, in particular:

- using peak intensity ratios of some major and trace elements measured with an energy dispersive X-ray spectrometer (Nelson, D'Auria, & Bennett, 1975);
- using peak intensity ratios of some trace elements measured with a wavelength dispersive X-ray spectrometer (Crisci, Ricq-De Bonard, Lanzafame & De Francesco, 1994; De Francesco, Crisci, & Bocci, 2008; Acquafredda, Muntoni, & Pallara, 2018);
- using an energy dispersive X-ray spectrometer coupled with a Scanning Electron Microscope (SEM-EDS), for glass (Acquafredda, Andriani, Lorenzoni & Zanettin, 1999) and microphenocrysts analyses (Acquafredda & Paglionico, 2004) of obsidian artifacts.

The analyses of the Ustica obsidian samples were performed at the Dipartimento di Scienze della Terra e Geoambientali dell'Università degli Studi di Bari Aldo Moro, where in over 30 years procedures have been developed for the characterization of obsidian provenance (Acquafredda et al., 1999; Acquafredda & Paglionico, 2004; Acquafredda et al., 2018; Acquafredda, 2019).

The 119 samples collected in the Casa dei Francesi site at Ustica were analyzed both by Wavelength Dispersive X-ray fluorescence (WD-XRF) and by Scanning Electron Microscopy equipped with an Energy Dispersive Spectrometer (SEM-EDS) to ascertain their provenance, since the isle of Ustica, though essentially composed of volcanic rocks, lacks obsidian outcrops.

In detail, the WD-XRF procedure is particularly useful because does not require any preventive treatment of the sample and is preferably used when the specimens are covered by thin carbonate encrustations or are very rich in pores (Acquafredda et al., 2018) or spherulites; *id est* millimetric spheroidal structures made by needle-like crystals. In fact, many obsidian artifacts could become extremely difficult to clean up from the sputtered carbon film necessary for SEM investigation, especially if they do not have a perfectly smooth surface; this happens when the samples are pore rich (pumice texture), as frequently occur for the Lipari obsidians, inside which sometimes secondary minerals can also grow (Acquafredda, Mitolo, & Muntoni, 2011); or for the specimens very rich in spherulites. The WD-XRF spectrometer, used for Ustica obsidian sample analyses, is a PANalytical AXIOS-Advanced equipped with a 4 kW Rh super sharp end window X-ray tube. The X-ray intensities of these trace elements were measured, as suggested in Acquafredda et al. (2018), under the following operating conditions of the XRF spectrometer: X-ray tube power supply 60 kV and 66 mA; scintillator detector to collect the X-ray lines dispersed by a LiF 220 crystal. For the XRF analyses, each sample was positioned at the center of a PANalytical sample holder, closed at the bottom by a very thin Mylar © film (Figure 3).

The SEM-EDS technique, for the characterization of the obsidian, is preferable if the samples are too small (Acquafredda, Muntoni, & Pallara, 2013). In this case, the X-ray intensities collected by a WD-XRF spectrometer do not allow an accurate measurement of those trace elements contained in extremely low concentrations, as in the case of the Sr of the Palmarola and Pantelleria obsidian sources whose concentration is near or below the detection limit of the WD-XRF spectrometer (Acquafredda et al., 1999). The same is true when the presence of numerous spherulites strongly contributed to the alteration of the whole rock composition during its burial period, significantly modifying the concentration of some trace elements, often leaving substantially unaltered the composition of the obsidian glass.

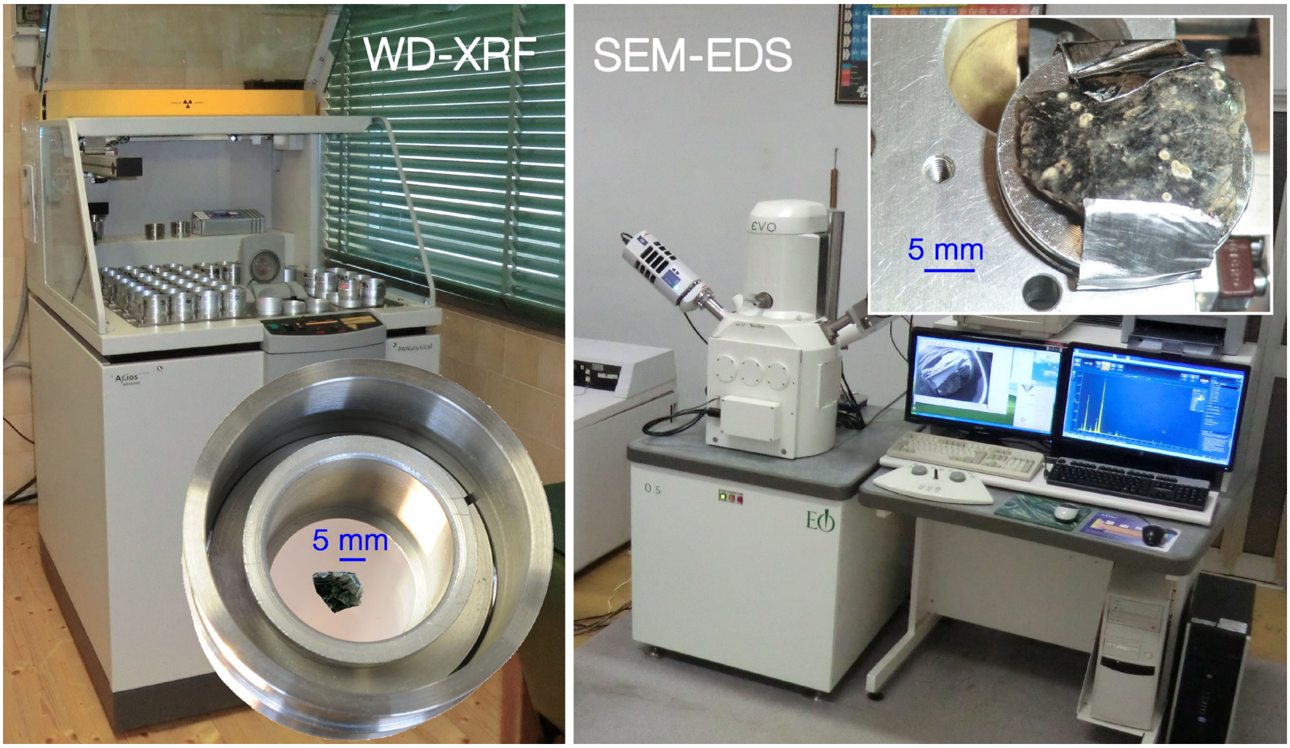

Figure 3: On the left side of the figure, the WD-XRF equipment used for chemical characterization of the obsidian samples and a detail of one sample holder closed at the bottom by a thin sheet of Mylar©, carrying in the center a very small obsidian artifact (in this figure the sample USFRA 101) which seems suspended in the air. On the right side of the figure the SEM-EDS used for glass microanalyses of the obsidian sample; in the inset a particular od the SEM sample holder with an obsidian sample (USFRA 4), whose surface was not sputtered with carbon film because particularly rich in spherulites: the specimen was fixed to the stub with adhesive aluminum conductive tape.

In both these cases, it is possible to analyze by SEM-EDS a very small part of the obsidian surface, whether the sample is very small or in the case its surface shows only very little areas not altered or completely free from spherulites.

Moreover, SEM-EDS data, obtained as absolutely non-destructive analysis, can be easily used for sourcing obsidian geological outcrops if compared with other geochemical literature data obtained with other different minimally invasive techniques, such as Electron Probe Microanalysis (EPMA) or Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP MS).

The comparison with other data obtained through other X-ray equipment must be done with great caution because the irregular surface of the obsidian does not always allow us to obtain quantitative analytical data. Quantitative analytical data can be obtained using ED detector focused on a small part of the sample surface which can, therefore, be considered as flat (Ruste 1979, Acquafredda & Paglionico, 2004, Acquafredda et al., 2018, Acquafredda, 2019).

SEM-EDS analyses of the Ustica obsidian samples were performed using a Zeiss-Leo EVO50XVP scanning electron microscope (Figure 3) equipped with an X-max (80 mm^2) Silicon drift Oxford detector. Electron probe operating conditions were: 15 kV, 500 pA and 8,5 mm working distance; the counting time was set at 50 s. X-ray intensities were converted to the concentration of the element using the XPP correction scheme (Pouchou & Pichoir, 1988, 1991), furnished as quantitative software support by Oxford-Link Analytical (U.K.). The microanalytical data were checked using reference materials (standards from Micro-Analysis Consultants Ltd.).

3.2 Typological and Functional Analyses

From a typological point of view, out of 119 obsidian finds analyzed only 4 represent man-made instruments, while the other 115 are debitages. With reference to Figure 4, all man-made tools are shown in the first row; in the following rows some representative samples of the debitages are shown.

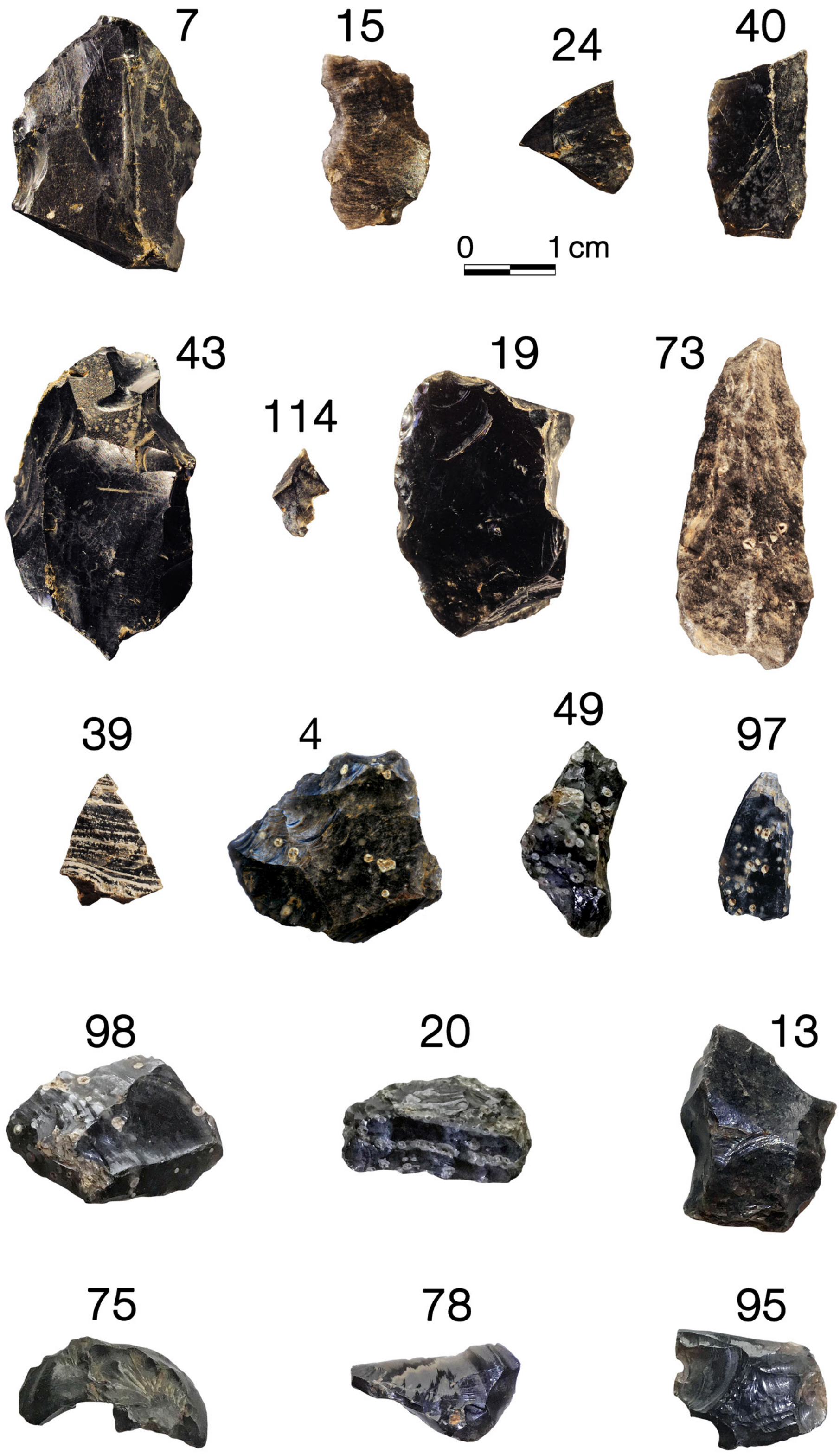

Figure 4: Some selected fragments of the Casa dei Francesi obsidian assemblage. In the first row, the only 4 obsidian samples recognised as man-made tools; in the following rows some representative samples of the debitages with particular texture or relevant typological characteristics. The numbers indicate the USFRA specimen, as described in the text.

The 4 obsidian findings clearly recognizable as intentionally man-made tools are:
- a specimen of a scraper with obvious marginal micro-retouching (USFRA 7 sample, Figure 4);
- a burin (USFRA 15 sample, Figure 4);
- a fragment of a blade with a triangular section (USFRA 24 sample, Figure 4);
- a fragment of lamella with a triangular section (USFRA 40 sample, Figure 4).

The debitages are generally small and show great morphological variety; often they bear traces of more or less marked conchoidal fractures on the body, and some of them show percussion bulbs. The largest specimen, USFRA 43 (Figure 4), is a debitage with dimensions 3.4 x 2.0 x 1.2 cm, and weight 8.99 g; the smaller one, USFRA 114 (Figure 4), is a sub-laminar debitage with dimensions 0.95 x 0.6 x 0.15 cm, and weight 0.06 g.

The raw material of the samples has different aspects. Most of the finds are made up of an absolutely pure and homogeneously black and shiny type of obsidian; a typical example of this typology is the USFRA 19 sample (Figure 4). A smaller part of the finds is obsidian with darker and opaque areas and lighter areas due to carbonate incrustations or micro-amygdaloidal texture (USFRA 73 sample; Figure 4). There are also obsidian fragments characterized by sub-parallel gray (pumice) and black (glass) bands indicating the lava flow, as in the case of the USFRA 39 sample (Figure 4). Many fragments are characterized by the presence of spherulites (USFRA 4, 49, 97, 98 samples; Figure 4), sometimes coalescent giving flow bands (USFRA 20 sample; Figure 4). Other specimens are flakes or fragments derived mainly from larger samples that have been fragmented while plowing the soil (USFRA 13, 75, 78, 95 samples; Figure 4).

4 Results and Discussion

The provenance of 114 out of 119 samples was determined by WD-XRF measuring the X-ray intensity ratio of Rb, Sr, Y, Zr, and Nb, taking into particular account to calculate the X-ray net intensities that are purified from the contribution of the background and interelemental interferences, as described by Acquafredda et al. (2018).

Plots of contiguous trace-elements intensity ratios Nb/Y vs Zr/Y, and Nb/Sr vs Rb/Sr (Figure 5) allow us to distinguish the obsidian sources of the Mediterranean area, and clearly indicate that 91 samples come from Lipari obsidian outcrops, and 23 samples from Pantelleria. In the latter case, it was possible to also distinguish the sub-source of Salto La Vecchia.

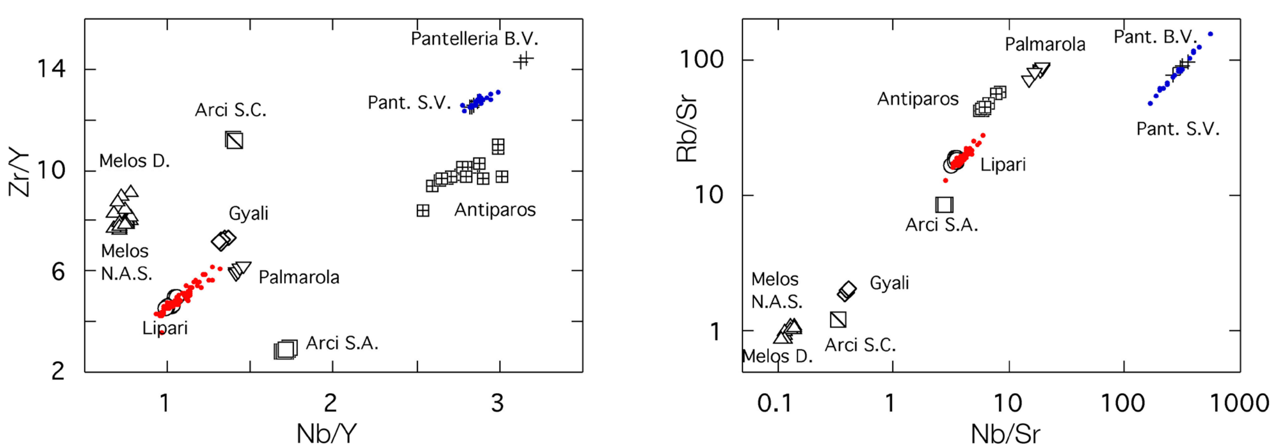

Figure 5: Plots of the WD-XRF X-ray intensity ratios measured on the Casa dei Francesi obsidians: provenance determination revealed source areas from Lipari (91 samples, red points) and the Salto la Vecchia sub-source of Pantelleria (23 samples, blue points). Only 5 samples (USFRA 1, 16, 97, 112, and 115) that are very small or particularly rich in altered spherulites were not plotted because their X-ray intensities gave very different values from those of the database. The literature data on different geological obsidian sources of the Mediterranean basin are from Acquafredda et al. (2018, 2019). Sub-sources outcrops: Monte Arci, S.C. = Perdas Urias; S.A. = Conca Cannas, Canale Perdera, and Riu Solacera. Pantelleria, B.V. = Bagno di Venere, S.V. = Salto la Vecchia, and Balata dei Turchi. Melos, D. = Demenegaki; N.A.S. = Nihia, Adamas, and Sarakiniko.

Only 5 samples (USFRA 1, 16, 97, 112, and 115) were so small or particularly rich in altered spherulites that they necessitated an analysis of the glass by SEM-EDS to ascertain their source area, as described in Acquafredda et al. (2013). In this case, plots of major elements SiO_2 vs CaO, and C.I.A. (Chemical Index of Alteration) vs FeO (Figure 6), allow attributing 2 samples to Lipari obsidian outcrops and 3 samples to Pantelleria.

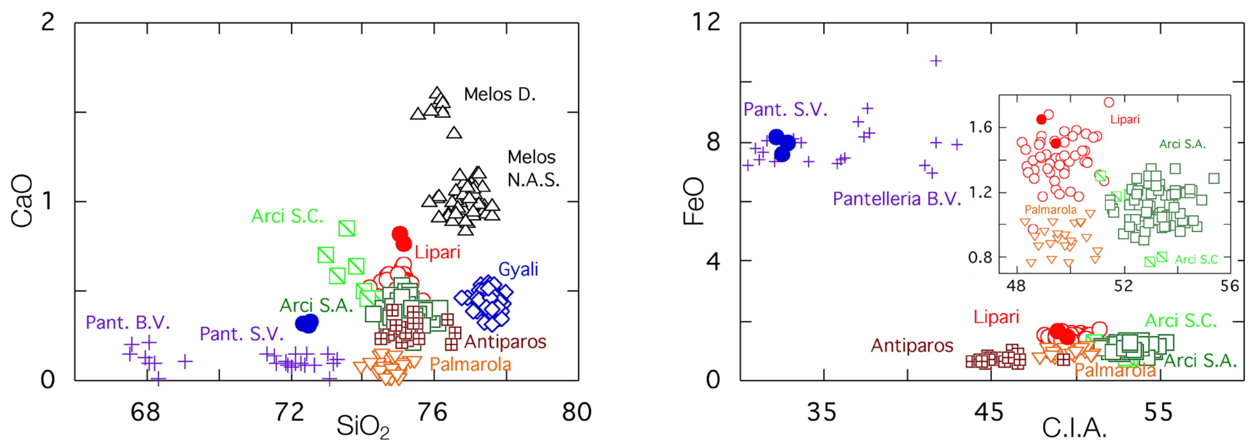

Figure 6: Plots of the SEM-EDS chemical analyses of the glass of 5 samples (1, 16, 97, 112 and 115) of the Casa dei Francesi obsidians whose provenance was not exactly determined by WD-XRF: two samples reveal provenance from Lipari (USFRA 16 and 97, red points) and the other three from Pantelleria S.V. (USFRA 1, 112 and 115, blue points). Each plotted value represents the mean of at least three ED microanalyses. The literature data on different geological obsidian sources of the Mediterranean basin are from Acquafredda et al. (1999, 2019). Sub-sources outcrops abbreviations as in Figure 5. C.I.A. = Chemical Index of alteration $[Al_2O_3/(Al_2O_3 + CaO + Na_2O + K_2O)$ in mol.%].

Putting it all together, provenance determination on the 119 obsidian samples of Casa dei Francesi site indicates exclusively two source areas: 93 samples from Lipari (78%) and 26 samples from Pantelleria (22%). Concerning the obsidians from the island of Pantelleria, it was possible to also establish the sub-source of Salto la Vecchia.

In recent years, the Laboratorio Museo di Scienze della Terra Isola di Ustica has promoted a lot of studies aimed at geochemical characterization and the provenance of obsidian artifacts collected on the island of Ustica, from which it appears that Lipari and Pantelleria are the two exclusive sources of raw material imported during prehistoric times, with the only exception of a single obsidian fragment originating from the Palmarola island (Foresta Martin et al., 2017). A statistic based on more than 500 analyses performed with various methodologies (EPMA, SEM-EDS, LA-ICP-MS, pXRF) has allowed inferring that at Ustica the prehistoric imports of obsidian from Lipari were around 85–90% and from Pantelleria around 15–10%. It had seemed that this distribution of obsidian imports has remained almost unchanged from the Neolithic to the Bronze Age and for the different settlements studied. (Foresta Martin et al., 2017; Foresta Martin & Tykot, 2019; Foresta Martin & La Monica, 2019; La Monica, Rotolo, & Foresta Martin, 2019; Tykot & Foresta Martin, 2020).

Now, the study on Casa dei Francesi obsidians brings a new result, indicating the highest percentage of obsidians imported from Pantelleria (22%) so far ascertained at Ustica. But the most interesting and innovative results of this study come from the typological and functional analyses carried out on the 119 obsidian fragments. The high number of processing chips (115, equal to 97%), compared to the number of tools (4, equal to 3%) suggests that the obsidian set examined could be the result of lithic reduction activity performed in a prehistoric settlement near to the area where the finds had been collected.

For the obsidian artifacts of Casa dei Francesi, a chronological attribution can be prudently assigned taking into account that:

i. these obsidian artifacts certainly do not have the same age as that of late Roman ceramics found in the Casa dei Francesi area;
ii. on the island of Ustica, obsidian artifacts attributed to Neolithic e/o Copper Age e/o Bronze Age periods have been already collected in various sites, e.g.: Pirozza Spalmatore (Mannino, 1998; Mannino & Ailara, 2016; Foresta Martin & Tykot, 2019), Piano dei Cardoni, Culunnella and Villaggio dei Faraglioni (Spatafora & Mannino, 2008; Spatafora, 2009; Spatafora, 2016; Mannino & Ailara, 2016; Foresta Martin et al., 2017; Tykot & Foresta Martin, 2020; Speciale et al., 2020);
iii. the typology of recognized instruments (lamella, blade, scraper, burin), allows them to be placed in a pre-Roman context, that is in prehistoric times.

Finally two hypotheses can be made on the location of the prehistoric settlement that returns these lithic findings. The most obvious is that the late Roman site of Casa dei Francesi was built on the ruins of a much older village. But it cannot be excluded that the superficial obsidian fragments have slipped downstream from the hills above Casa dei Francesi, in particular, the relief of Monte Guardia dei Turchi and of Culunnella hill, due to the recurrent natural phenomena of land transport during torrential rains. Only archaeological excavations in this area will be able to solve the dilemma.

5 Conclusion

Geochemical and typological analyses carried out on 119 obsidian fragments collected in the Tramontana-Casa dei Francesi area (Ustica) raise questions about the existence of prehistoric settlements in the area of the Casa dei Francesi or its vicinity. Although the area is so far known as a site rich in pottery remains from the late Roman era, the presence of abundant obsidian fragments allow us to hypothesize a lithic reduction activity carried out in prehistoric times, in which the obsidian cores imported from Lipari and Pantelleria were chipped to obtain lithic tools, such as blades, burins, scrapers, etc. This hypothesis is based on the great number of processing waste compared to the finished tools identified in the abundant set of finds. The processing techniques favor an attribution of the findings analyzed to the Neolithic and Eneolithic horizons. Finally, the geochemical fingerprint of the obsidian findings attests to the highest share of imports from the distant island of Pantelleria (22%) so far ascertained in the archaeological sites of Ustica, compared to the anyway predominant share of imports from the nearest island of Lipari. Only an accurate and systematic archaeological survey of the whole East Tramontana area, possibly accompanied by some excavation essays, will be able to test the hypotheses raised by our study.

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