Prehistoric Obsidian Trade in Central-Northern Italy:

Artifact Analyses from the Neolithic Site of Poggio Olivastro (Canino-Viterbo)

R.H. Tykot, G.M. Bulgarelli, R.J. Speakmann & M. Glascock*

Introduction

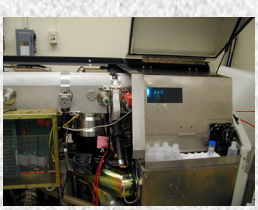
Obsidian, a volcanic glass, was widely used for stone tools during the Neolithic period (ca. 6000-3000 BC) in Italy and elsewhere in the central Mediterranean, with accessible geological sources on the islands of Lipari, Palmarola, Pantelleria, and Sardinia. A grant from the National Science Foundation (BCS-0075535) has supported detailed geological surveys and chemical characterization studies, and the sourcing of a statistically significant number of samples from recently excavated archaeological sites. Presented here are the results for the Neolithic site of Poggio Olivastro in central Italy.

Poggio Olivastro

The excavation of the Middle-Late Neolithic site of Poggio Olivastro has produced more than 600 obsidian artifacts, the most found at any northern Italy site except for Pescale and possibly Fornace Cappucini, while having a proper archaeological context which allows for a much more detailed and complete interpretation of obsidian found at this site. Detailed visual and density analysis was performed on over 300 artifacts, and 100 were then randomly selected for chemical analysis. The samples come from three specifically different areas of the site: Area 65 itself includes samples from different contexts; area 71 samples represent different stratigraphic layers, containing diagnostic ceramics; and area 72 samples are from different types of pit and canal deposits. The number of samples being tested allows for the study of intrasite variability.

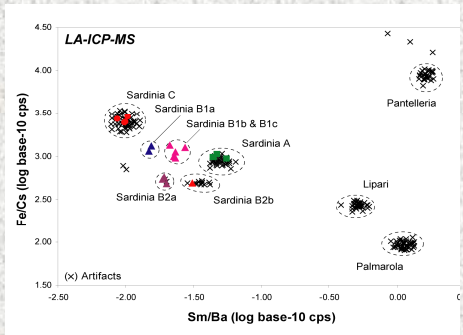
Analytical Instruments

Analytical techniques frequently used for obsidian sourcing in the Mediterranean region include neutron activation analysis (INAA), x-ray fluorescence (XRF), electron microprobe, and fission track dating (FT). Laser ablation ICP mass spectrometry (LA-ICP-MS), was selected for this study because it has already been demonstrated to be able to differentiate all of the Mediterranean sources and subsources, while being minimally destructive to artifacts. Analyses were specifically done using a Thermo Elemental Axiom high resolution magnetic sector ICP coupled to a Merchantek Nd-YAG 213-nanometer laser ablation unit, at the Missouri University Research Reactor laboratory.



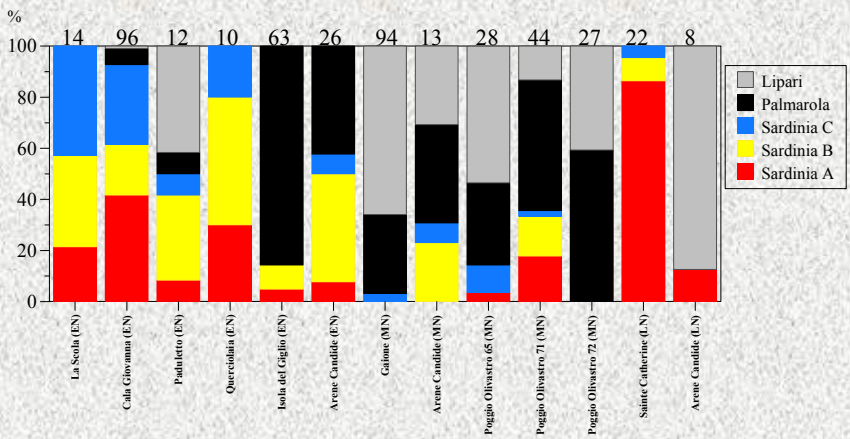
LA-ICP-MS Analysis Settings

The laser was operated at 80% power (~1.5 mJ) using a 200 Fm beam at 20/sec. A rectangular raster pattern approx. 4 mm^2 was drawn over a flat spot at 70 Fm per second. The beam passed over the ablation area once before acquisition to remove contaminants and allow time for sample uptake and argon plasma stabilization. Analytes of interest were scanned three times and averaged. About 40 elements were measured using a resolution of 6000. Relative concentrations for all elements were determined using NIST standards.



Data

The graph above uses logarithmic element ratios to show the geological source groups defined in earlier studies. Reference samples re-tested in this study are also shown, in color). Archaeological samples are then plotted, and in all cases reliably attributed to a specific source or subsource.



Results and Discussion

Except for Pantelleria, all major obsidian sources in the central Mediterranean are present at Poggio Olivastro. This is not surprising, compared to other Neolithic sites in central-northern Italy (see barchart above). The Sardinian sources are clearly less important in central Italy, given the greater proximity to Lipari trade connections. Palmarola obsidian is again shown to have been much more important than previously thought. More significant are the differences within Poggio Olivastro, with Sardinian obsidian accounting for more than 35% of the 44 samples in area 71, but not present at all in area 72. The similar proportions of Lipari and Palmarola obsidian in all three areas of Poggio Olivastro – as well as the other Middle Neolithic sites of Gaione and Arene Candide – suggest the regular use of those obsidian sources in peninsular Italy, while the Sardinian obsidian may have served special purposes within the site of Poggio Olivastro. Studies of the lithic typology as well as use-wear analysis will further our understanding of long-distance obsidian trade in the central Mediterranean.

* University of South Florida, Tampa, USA. email: rtykot@cas.usf.edu; web: http://luna.cas.usf.edu/~rtykot