Journal of Archaeological Science: Reports 21 (2018) 1–9

Contents lists available at ScienceDirect

Journal of Archaeological Science: Reports

journal homepage: www.elsevier.com/locate/jasrep

# Lunati and the island of towers: Obsidian in Nuragic Sardinia

Kyle P. Freund

*Department of Anthropology, Indian River State College, Rm. E115, 3209 Virginia Avenue, Fort Pierce, FL 34981, USA*

ARTICLE INFO

*Keywords:*
Obsidian
Central Mediterranean
Sardinia
Bronze Age Nuragic
X-ray fluorescence (XRF)
Lithic analysis
Kombewa technology

ABSTRACT

This paper discusses Bronze Age Nuragic obsidian exploitation by combining raw material sourcing with techno-typological analysis of a total of 363 obsidian artifacts from two sites in west-central Sardinia. The results are then combined with previously published data to make broader interpretations about obsidian reduction strategies and island-wide exchange networks, making it one of the largest compilations of data on Nuragic obsidian procurement, production, and consumption to date.

These new data add nuance to prior generalizations of Nuragic obsidian consumption as an expedient flake-based technology centered on the exploitation of one primary outcrop of obsidian, in turn highlighting the presence of bladelet production as well as regional differences in source exploitation that are distinct from earlier time periods. Despite such diversity, lunates of SC obsidian are ubiquitous and may have circulated as finished products. In this context, the exchange of obsidian likely acted as a means of regulating social relations across space, in turn structuring the flow of goods, information, and ideas that were key to the creation and maintenances of Nuragic identity.

## 1. Introduction

The Bronze Age Nuragic period of Sardinia is an era of cultural transformation characterized by architectural innovation, emergent social and political complexity, new and evolving connections with the outside world, and the appearance of a shared island-wide identity that is distinct from earlier times (Depalmas and Melis, 2010; Webster, 2015). While the archaeological manifestations of Nuragic culture are well studied, there has been comparably limited discussion concerning the social and cultural processes under which these changes were realized and maintained.

Since archaeologists often assume that people who share the same material culture also share similar cultural practices, kin relations, or ethnic identities (Schiffer, 2007), analyses of patterns of obsidian exploitation can be used to infer the existence of distinct cultural groups and social boundaries (e.g. Freund, 2018; Lazzari et al., 2009; see Freund, 2013 for further discussion). Obsidian is nearly ubiquitous at Nuragic sites across the island, so understanding patterns in the distribution of obsidian across the landscape can contribute to these debates and allow for the reconstruction of the social relationships that facilitated the flow of goods, information, and ideas across space. This study in particular combines raw material sourcing by means of energy-dispersive X-ray fluorescence (EDXRF) spectrometry with techno-typological analysis of a total of 363 obsidian artifacts from two Bronze Age Nuragic sites in west-central Sardinia, including Bingia 'e Monti (n = 144) and Nuraghe Pidighi (n = 219; Fig. 1). These new data add nuance to prior generalizations of Nuragic obsidian consumption as an expedient flake-based technology centered on the exploitation of one primary outcrop of obsidian (e.g. Freund and Tykot, 2011), in turn highlighting the presence of bladelet production as well as regional differences in source exploitation that are distinct from earlier time periods. Despite such complexity, Nuragic sites are nevertheless unified by the widespread prevalence of backed lunates, *lunati*, whose modes of production and distribution operated separately and under distinct socio-economic conditions.

Obsidian is a volcanic glass that was the main raw material for tool production on Sardinia from roughly the sixth to second millennia BCE (Table 1), and while there are four major sources of obsidian within the broader central Mediterranean region, only raw materials from sub-sources on the island itself were exploited by local peoples. Since the 1960s, over 5000 artifacts from almost 100 prehistoric Sardinian sites have been sourced to their geological origins, the majority of which date to the Neolithic (ca. 6th–4th millennia BCE). While it has long been recognized that obsidian was widely exploited during the Chalcolithic and Bronze Ages (e.g. Puxeddu, 1958), only a small percentage of these artifacts have been analyzed, many of which focus on raw material sourcing alone, without considering the specific forms in which the obsidian circulated, the techniques by which they were worked, and the form of the final tools.

Following leads from elsewhere (cf. Carter et al., 2016; Lugliè et al., 2011; Orange et al., 2017), this paper advocates a form of artifact characterization that integrates all of these considerations in order to

*E-mail address:* kfreund@irsc.edu.

https://doi.org/10.1016/j.jasrep.2018.06.032
Received 12 February 2018; Received in revised form 6 May 2018; Accepted 24 June 2018

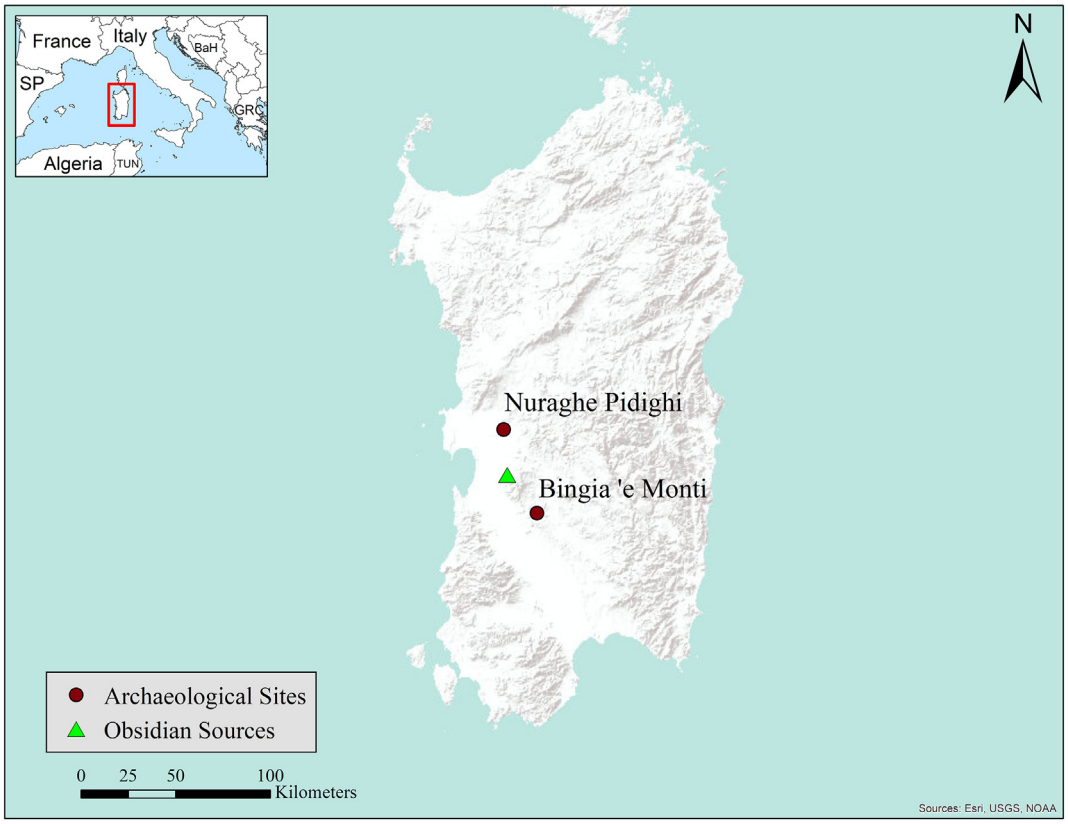


**Fig. 1.** Map of the analyzed Nuragic sites.

**Table 1**
The periods, cultural phases, and absolute dates (calibrated) of Sardinian prehistory (after Tykot, 1994: 129). This paper adopts the above scheme because it was used to date the analyzed sites. Note that alternative terminology and slightly altered dating schemes also exist based on revised ceramic seriation data (see Spanedda, 2002; Webster, 2015).

| Period | | Cultural phase | | Absolute dates |
|---|---|---|---|---|
| Mesolithic | | Grotta Corbeddu | | 11,000–6000 BCE |
| Neolithic | Early | Su Carroppu | | 6000–5300 BCE |
| | | Filiestru-Grotta Verde | | 5300–4700 BCE |
| | Middle | Bonu Ighninu | | 4700–4000 BCE |
| | Late | --------San Ciriaco-------- Ozieri | | 4000–3200 BCE |
| Chalcolithic | Early | Sub-Ozieri Filigosa Abealzu | | 3200–2700 BCE |
| | Middle | Monte Claro | Beaker A | 2700–2200 BCE |
| | Late | | | |
| Bronze Age | Early | Bonnanaro A | Beaker B | 2200–1900 BCE |
| | Middle | Bonnanaro B | | 1900–1600 BCE |
| | | Nuragic I | | 1600–1300 BCE |
| | Late | Nuragic II | | 1300–1150 BCE |
| | Final | Nuragic III | | 1150–930 BCE |

appreciate the full range of socio-economic processes and cultural traditions that underpin Nuragic obsidian consumption at Bingia 'e Monti, Nuraghe Pidighi, and beyond.

## 2. Site backgrounds

Sardinia is known as the “island of towers” due to the presence of approximately 7000 truncated cone-shaped stone structures, called *nuraghi*, that were built throughout the island over the course of the second millennium BCE (Lilliu, 1982; Moravetti, 2012). These structures were often surrounded by residential villages and consist of corbelled dome towers composed of basalt and granite, averaging roughly 12 m in diameter and 15–20 m in height, although there is a wide range of variation (Balmuth, 1984). Nuragic architecture was part of much wider tradition of monumental stone construction seen in Greece (*tholoi*), Corsica (*torri*), and the Balearics (*talayots*), but despite their ubiquitous presence archaeologists are surprisingly divided as to their purpose. Some argue that nuraghi are best seen as defensive structures constructed by upwardly mobile elites, while others see them as communal compounds built to symbolize a newly-formed insular identity. A more nuanced stance has recently been taken by Webster (2015: 79) by framing nuraghi construction within concerns for both security as well as social status, a phenomenon whose realization created the very cultural, social, and psychological conditions that encouraged their reproduction. Prior studies have shown no significant differences in obsidian exploitation within the nuraghi compared to that of surrounding villages (see Freund and Tykot, 2011).

### 2.1. Bingia 'e Monti

Bingia 'e Monti is located in south-central Sardinia and is a single-tower nuraghe with an attached enclosed courtyard (Fig. 2). The site was excavated in the years 1983–1985 and 1988–1990, originally led by Giorgio Murru and later by Enrico Atzeni and Alessandro Usai. Its earliest occupation dates to the Monte Claro phase of the Chalcolithic (ca. 2700–2200 BCE) and is represented by two circular residential stone structures that underlay later Nuragic construction - see Freund (2014) for information on obsidian use during these earlier phases of occupation.

The Nuragic phases of the site are dated on the basis of their characteristic ceramic assemblages, with the site being occupied in the late Nuragic I and Nuragic II periods (ca. 1400–1150 BCE).