Journal of Archaeological Science: Reports 18 (2018) 577–586

Contents lists available at ScienceDirect

Journal of Archaeological Science: Reports

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

Obsidian procurement and distribution in the Northwestern Maya lowlands during the Maya Classic, a regional perspective

Flavio G. Silva de la Mora

UC Berkeley, United States

ARTICLE INFO

Keywords:
EDXRF
Northwestern Maya lowlands
Material studies
Obsidian
Technological analysis

ABSTRACT

A collection of 1338 obsidian artifacts and debitage from 37 archaeological sites (Early Formative to Late Classic) in the Northwestern Maya lowland in Mexico were analyzed using EDXRF and an attribute analysis. The study includes obsidian collected from urban population nodes like Chinikihá, Moral-Reforma, and Yaxchilán, incorporating the different types and size of settlements that include single platforms in the rural areas. The study illustrates a global perspective of the local communities in their daily use of obsidian. The application of an elemental sourcing analysis yielded the provenance of obsidian from sources in Guatemala (El Chayal, Ixtepeque, Jilotepeque) and Mexico (Zaragoza, Pachuca, Penjamo), pointing to the complex interregional and long-distance network of exchange that extended beyond the study area.

1. Introduction

Obsidian is a volcanic glass used in the production of utilitarian and ritualized goods throughout Mesoamerica and the Maya region (Cobean, 2002). The unique geochemical characteristics of obsidian and the particular chemical variation between sources make it an ideal material for geochemical source attribution and for reconstructing interregional and long- distance exchange networks (Cobean, 2002; Shackley, 2011a). This paper reports and discusses the attribution to source by Energy Dispersive X-ray Fluorescence (EDXRF) of a sample of 1238 obsidian artifacts recovered at 37 archaeological sites in the northwestern Maya lowlands (NWML) in Chiapas and Tabasco, Mexico (refer to Fig. 1 below). The analysis corroborates and expands previous obsidian source attribution for the study region using more advanced geochemical tools than were available in previous research (Johnson, 1976a, b).

The artifacts and debitage were collected at 37 archaeological sites in the NWML and reflect the production and consumption at regional centers and rural areas, as illustrated in Fig. 2 and Table 1. The artifacts were analyzed using a behavioral typology that allows for the identification of products and by-products of production, elucidating the reductive techniques of stone tool technology (Sheets, 1975, 2003). The material is conceptualized as the reflection of shared daily practices and local traditions which were part of the local communities (Hanks, 1990; Lave and Wenger, 1991; Mauss, 1973). The material is evidence of shared knowledge of stone tool production, exchange, and consumption of imported obsidian during the Maya Classic (400–900 CE). The majority of the contexts were dated using a relative chronology based on ceramic analysis, with the clearest occupation for this study dated to the Late Classic (700–900 CE). Some archaeological sites do present evidence of occupation starting in the Late Formative (250–450 CE), as reported for Palenque and the surrounding region (Rands and Rands, 1957). Carbon dates from excavations at Chinikihá were also used to strengthen the chronological placement (Silva de la Mora, 2017).

The territory is characterized by a linear distribution of sites connected through roads, rivers, and social practices along a piedmont topography of the Sierra Madre foothills (Liendo Stuardo, 2005; Silva de la Mora, 2008, 2017). The materials collected represent the entire spectrum of archaeological variability in the region, including the larger seats of power such as Yaxchilán, Moral-Reforma, and Chinikihá (Culbert, 1991; Marcus, 1976; Martin and Grube, 2000) and the smallest types of settlements, represented by isolated platforms and material scatters in the rural areas of the NWML (Liendo Stuardo, 2005: 33).

The local communities had access to obsidian tools produced and consumed locally from imported polyhedral cores. Obsidian tools were part of local practices that included knowledge by local crafters in the production of prismatic blades and the hafting of obsidian fragments to produce tools. Previously, obsidian reported in the region points toward a shared constellation of practices surrounding the production and daily uses of pressure blade technology by the local communities (Balcells Gonzalez, 2011; Herckis, 2015; Johnson, 1976a; López Bravo, 2013; Silva de la Mora, 2017).

The importance and ubiquity of obsidian has resulted in increased research in the greater Mesoamerica region to understand its procurement, mining, and distribution (Cobean, 2002; Glascock, 2002). This volcanic glass was part of a complex system of exchange that connected

E-mail address: flavgsil@gmail.com.

https://doi.org/10.1016/j.jasrep.2018.01.031
Received 9 October 2017; Received in revised form 19 January 2018; Accepted 19 January 2018

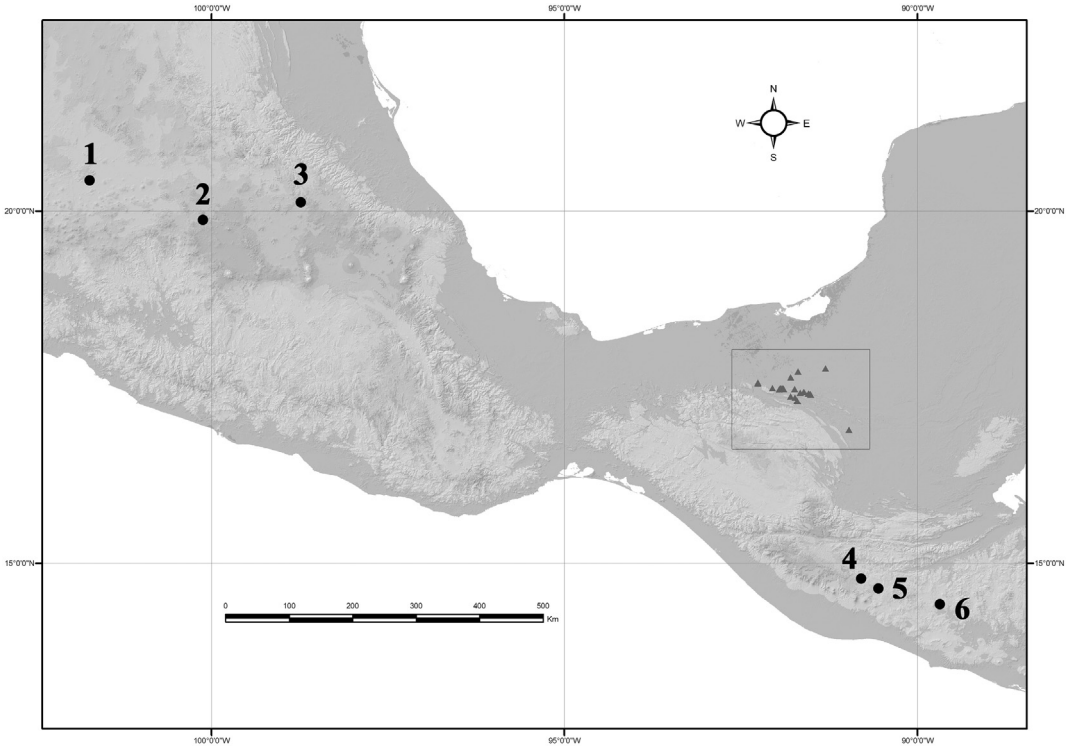

Fig. 1. Location of study region and obsidian sources identified: 1) Penjamo, 2) Zaragoza, 3) Pachuca, 4) Jilotepeque, 5) El Chayal, 6) Ixtepeque.

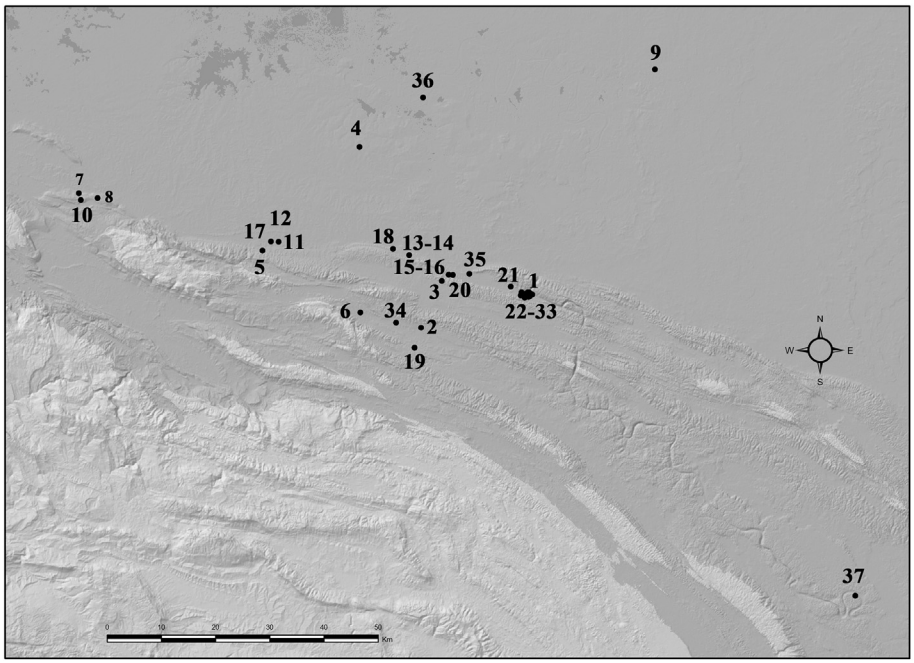

Fig. 2. Highlights the location of sites within the study region.

the flow of many goods through interregional and long-distance exchange networks. Previous research looks at social practices that included the mining and organization surrounding the circulation of obsidian from specific sources that led to distribution mechanisms integral to the development of political, economic, and socially based structures in the Classic period (Anderson and Hirth, 2009; Golitko and Feinman, 2014). The region is characterized by having access to the Tulijá River in the west and the Usumacinta River in the east. The Usumacinta River was an avenue for obsidian polyhedral cores from the highlands of Guatemala to be distributed through ports such as Boca Chinikihá, Cancuén, Piedras Negras, and Yaxchilán to the many valleys and surrounding communities (Demarest et al., 2014; Hruby, 2006; Johnson, 1976a; Sidrys, 1977; Silva de la Mora, 2017). The Tulijá River was an avenue to both the highlands of Chiapas and the Gulf of Mexico (Canter, 2015; Silva de la Mora, 2017). The physical topographic characteristics created settlements which were distributed along the different valleys constituting the Sierra Madre Noroccidental (Teranishi, 2011).

The nature of pressure blade technology is thought to be related to its successful presence and value in daily practice for centuries