Silcrete procurement system in Uruguayan prehistory

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ABSTRACT

This paper summarizes information on the role of silcrete rocks as raw material in Uruguayan Prehistory. The spatial distribution of sources, the procurement strategies and projectile point technology are discussed. We present a lithic database for Northern, Central and Southern Uruguay, especially from the Los Indios archaeological site (Department of Rocha) in the Eastern lowlands, to illustrate the use of silcrete in lithic bifacial technology, particularly in the production of projectile points.

In this paper, thin-sections of archaeological materials from the early and middle levels (between ca.3.5 ky and ca.7.0 ky BP) from Los Indios site were also examined, as well as geological samples from potential quarries in the Departments of Soriano and Flores. Finally, the paper discusses the different strategies used to obtain and transport lithic raw materials from distant quarries in Central and Northwestern Uruguay to the Atlantic coast.

1. Introduction

Exploration and later colonization processes of South America took place over different episodes of human dispersal (Borrero, 1999; Bueno et al., 2013; Steele, 2010; Miotti, 2006). Human adaptation to different environmental conditions produced particularities in material culture and in economic decisions. In recent years, an increasing amount of data has been collected in Uruguay (30°–35° S to 58°–54° W) (Fig. 1) from archaeological sites located near important watercourses and their tributaries (Uruguay, Negro and Tacuarembó rivers) (Austral, 1995; Gascue, 2009a, 2009b; Nami, 2007, 2016; Suárez, 2009, 2016; among others) as well as from hills and lagoons near the Atlantic coast (López Mazz and Iriarte, 1995; López Mazz, 2001, 2013; Meneghin, 2004, 2006; Suárez and López Mazz, 2003).

Studying the source of lithic raw materials is very important in order to reconstruct lithic technology and economic organization (Collins, 1975). Different theoretical approaches develop specific archaeological strategies to study residential and economic mobility in prehistory (Binford, 1968; Borrero, 1999; Féblot-Augustins, 1999; Higgs and Vita Finzi, 1972; Grove, 2010; Meignen et al., 2009). In order to design explanatory models of prehistoric territoriality it is necessary to identify the provenance of lithic raw materials, to analyze the chaîne opératoire (Leroi Gourham, 1964) of different tools and reconstruct regional circulation of raw materials (and stone tools) and long-distance transport (López Mazz et al., 2009).

New archaeological data allows the reconstruction of palaeoeconomy, regional settlement patterns and lithic procurement strategies of hunter-gatherers north of the River Plate basin. Silcrete, among other rocks, was used by prehistoric hunter-gatherers since the earliest settlement of this area (Bosh et al., 1980; Politis, 1991; Suárez, 2016; Nami, 2016). Nevertheless, silcrete is not such a common word among Uruguayan archaeologists, who typically employ different terms such as “silicified limestone” (López Mazz et al., 2009; Gascue, 2009a, 2009b) “chert” (Suárez, 2009) “limestone” (López Mazz et al., 2011) “reddish limestone” (Flegenheimer et al., 2003) also known as “carneolita” (Taddéi, 1977). Just recently, the work of Gascue (2012), López Mazz et al. (2011), Meneghin (2004) and Nami (2010, 2016) introduced the term silcrete to focus on and classify a specific rock within Uruguayan prehistory.

Silcrete, among other siliceous lithic raw materials with good conchoidal fracture (chalcedony, agate, opal, fossil wood, etc.), was one of the most preferred by hunters who produced bifacial and unifacial tools, projectile points, scrapers and other finely knapped tools (Gascue, 2009a; López Mazz et al., 2011, 2015; Nami, 2016). The silcrete outcrops are distributed throughout a significant part of the Uruguay River basin, often associated with archaeological sites, in Argentina (Carrera et al., 2015; Flegenheimer et al., 2003; Nami, 2010) and in different locations of Uruguay (Baëza, 1992; López Mazz and Gascue, 2005; Gascue, 2009a, 2009b; Meneghin and Sanchez, 2009; Nami, 2016; Suarez, 2013).

Silcrete has been the subject of important geological studies (Thiry and Milnes, 1991; Ullyot et al., 1998). The exploitation of silcrete deposits by humans for tool production is a subject gaining increasing focus in international research particularly as a lithic raw material in global context (geology, sourcing and technology) (Delagnes et al., 2016; Flegenheimer et al., 2003; Nami, 2016; Wragg Skyes, 2015).
The first South American peoples of the end of Pleistocene period (ca 13–11 ky BP) produced lithic technology with bifacial “Fishtail Projectile Points” (FPPs) (well dated to ca 10.7 to 10.3 ky BP) and other unifacial and bifacial scrapers of silcrete stone (Nami, 2010; Prates et al., 2013; Politis, 1991; Suárez, 2016). Experimental work reproducing South American FPP has provided further details of its reduction sequence, related to silcrete qualities which permit flaking techniques (Nami, 2010).

In the Pleistocene/Holocene transition and in the early Holocene (ca 11 to 9 ky BP) hunter-gatherers continued to use silcrete and other rocks to produce a specialized projectile point technology adapted to the new landscapes (López Mazz, 2013; López Mazz et al., 2015; Suárez, 2009; Suárez, 2016). Later in the early and mid-Holocene (ca 9 to 2.5 ky BP) these societies decreased their economic and social mobility and remained far from silcrete sources. Nevertheless, they developed new technological organization and procurement strategies to ensure the availability of this excellent raw material for making tools (López Mazz et al., 2009).

This paper provides a summary of the role of silcrete raw material in Uruguayan prehistory regarding the quality and spatial distribution of sources, procurement strategies and projectile point technology. We report a lithic database from the Los Indios archaeological site (Fig. 2) in the eastern lowlands of Uruguay in order to illustrate the use of silcrete, especially in projectile point technologies, and discuss the strategies to obtain and transport this lithic raw material from quarries located at considerable distances.

This research also aims to enhance our knowledge of territorial expansion so as to best understand economic choices, technological organization, human exchanges of tools and adaptation processes to living in the lowlands. Climatic and sea level changes in post Pleistocene times created new scenarios for systemic relations between humans and nature, particularly in the east of Uruguay and the south of Brazil (Ayup, 2006; Días, 2012; López Mazz, 2013).

2. Previous research on siliceous raw materials

Silcrete is found in Uruguay at different locations, either as a primary source (outcrops) (Fig. 3) or in secondary deposits (rivers) (Fig. 4), frequently associated with prehistoric settlement and lithic workshops (Gascue, 2012; López Mazz and Gascue, 2005; Nami, 2007, 2016). This rock was described as a silicified limestone with an intense silification process (Baeza, 1992).

In Uruguay limestone has different “facies”. The most relevant for archaeologists are silicified examples. Silification was diagenetic and superimposed on calcretes, and has a different occurrence according to the locations (Martínez et al., 2015). Silcretes and calcretes are mainly related to two independent lithostratigraphic units: the Mercedes formation and the Queguay formation (Bacci et al., 1975).

Archaeologists often identify lithic raw materials used for prehistoric tools on the lithostratigraphic unit of Calizas del Queguay (Queguay limestones), which crops out in the eastern basin of the Uruguay River (Baeza, 1992; Nami, 2016; Suárez, 2009). Others local silcretes were used by prehistoric hunter-gatherers in settlements of the Río Negro Basin (Nami, 2007, 2016; Gascue, 2009a, 2009b, 2012) and in the Santa Lucía Basin (Baeza, 1992).

In archaeological sites of eastern Uruguay (lowlands and Atlantic coast), far from their outcrops and secondary deposits, silcretes are seldom present. Even though silcrete was not available in this area, over time prehistoric hunters preferred this raw material and imported it over long periods for producing bifacial tools (especially projectile points and different types of scrapers) (López Mazz et al., 2015).

In spite of the existence of silcrete rock sources in the Pampa region in Argentina, Flegenheimer et al. (2003) identified silcrete transported from the Queguay formation in Uruguay. The study of 30 early sites Pleistocene/Holocene transition allows us to reconstruct a lithic raw material procurement system, mostly based on local and regional rocks with exceptionally in long-distance transportation (400/500 km) of...
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