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Exploring the culinary uses of *Santa María* and *Belén* painted vessels from the Late Intermediate Period in Catamarca, Argentina

Irene Lantos [a,*], Valeria Palamarczuk [b], Martín Orgaz [c], Norma Ratto [b], Marta Maier [a]

[a] Universidad de Buenos Aires, Consejo Nacional de Investigaciones Científicas y Técnicas, Unidad de Microanálisis y Métodos Físicos aplicados a la Química Orgánica (UMYMFOR), Facultad de Ciencias Exactas y Naturales, Intendente Güiraldes 2160, C1428EGA Ciudad Autónoma de Buenos Aires, Argentina
[b] Universidad de Buenos Aires, Instituto de las Culturas (IDECU) UBA-CONICET, Facultad de Filosofía y Letras, Museo Etnográfico J B Ambrosetti. Moreno 350, C1091AAH Ciudad Autónoma de Buenos Aires, Argentina
[c] Universidad Nacional de Catamarca, Escuela de Arqueología, Avenida Belgrano 300, Campus Universitario, K4700 San Fernando del Valle de Catamarca, Provincia de Catamarca, Argentina

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ABSTRACT

Santa María and *Belén* vessels from the Late Intermediate Period (10th–15th centuries AD) in Northwest Argentina are strongly associated to funerary uses as "urns". However, multiple recent findings of these vessels in domestic non-funerary contexts point towards diverse utilities. In this paper we carried out an exploratory analysis and selected two case studies of *Santa María* vessels and one of a *Belén* vessel, all recovered in household floors from three sites in Catamarca, Argentina. In order to enquire into the potential culinary uses of vessels, lipid residues were extracted from the ceramic matrixes and gas chromatography–mass spectrometry (GC–MS) analyses were carried out to explore their origins. In all three vessels lipid residues were recovered and characterized. Two samples showed evidence of plant and animal lipid mixtures, while the third sample only had animal lipids. The culinary utility of these vessels was confirmed, and uses may have included storage or service of liquids or stews. These preliminary results provide insight into an alternative interpretation of *Santa María* and *Belén* vessel use.
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1. Introduction

The Late Intermediate period (10th–15th centuries AD) in Northwest Argentina was characterized by an increasingly complex social organization, demographic growth, political conflicts, and overall change in the mode of living (Tarragó, 2000). Evidence of this shift in lifestyle can be observed in architectural patterns, agricultural installations, and in new regional styles of ceramics, metals, textiles and rock art. In particular, two ceramic styles were dominant during the Late Intermediate period in some valleys of the province of Catamarca, Argentina: (a) the *Santa María* style in the Calchaquí and Yocavil valleys and nearby areas, and (b) the *Belén* style in the Hualfín, Abaucán and Andalgalá valleys (Bennett et al., 1948; González, 1950, 1977). These styles continued to coexist with Inca styles during the late 15th and 16th centuries AD when NW Argentina was incorporated into the empire (Calderari and Williams, 1991; González and Tarragó, 2005).

Santa María and *Belén* ceramic assemblages, despite their diversity, can be categorized in two main morphologies: vessels sometimes called "urns" (*tinajas* or *urnas*) and bowls (*pucos*) (Baldini and Sprovieri, 2014; Palamarczuk, 2014; Puente and Quiroga, 2007).

Vessels and bowls are usually associated with funerary practices (Amuedo, 2015; Marchegiani et al., 2009; Nastri, 2003). In many cases vessels were used as urns to hold human remains -usually young children- and bowls were used as lids. Vessels containing human remains have been found both in cemeteries and within domestic areas. Although the association of vessels to mortuary practices is well established, we believe it has been skewed by many studies using collections from late 19th and early 20th century expeditions, which targeted the recovery of funerary material remains (Podgorny, 2004; Ramundo, 2007). Recent studies have reported the recovery of *Santa María* and *Belén* vessel style fragments within the household floors and dump areas and with no link to funerary use. As a result, there is a growing consensus among archaeologists that vessels played important roles in daily life activities in domestic contexts (Greco et al., 2012; Iucci, 2016; Nastri, 1999; Orgaz et al., 2007; Palamarczuk, 2008; Piñeiro, 1996; Rivolta and Salazar, 2006; Roldán and Funes, 1995;

* Corresponding author at: Intendente Güiraldes 2160, C1428EGA Ciudad Autónoma de Buenos Aires, Argentina.
E-mail address: irenelantos@qo.fcen.uba.ar (I. Lantos).

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Sempé, 1984, Sempé 1976; Sjodin, 2001; Williams, 2003; Wynveldt and Iucci, 2009; Wynveldt, 2008).

In spite of this, we often continue to refer colloquially to these vessels, beyond their context of recovery, under the name of "*Santa María urns*" or "*Belén urns*", as these nomenclatures refer to well-known specific morphologies, emblematic in the archaeology of the Argentine Northwest (*Primera Convención Nacional de Antropología*, 1966). The label "urn" which has been used in the past, and continues being used today as a professional archaism, contributes to the persistent, possibly unconscious perception of *Santa María* and *Belén* vessels as funerary containers. It is relevant to point out that the vessels found in domestic contexts have the same morphological and decorative characteristics as those used as funerary urns.

Following Rice (1996), the "use" of a vessel refers to the specific way in which it serves a particular purpose. From an archaeological perspective specific uses can be inferred from the physical and morphological properties of the vessels, the presence of marks, wear patterns, impregnated materials, and from information on the finding context (Skibo, 1992).

Use-wear evidence is scarce and often ambiguous in *Santa María* and *Belén* vessels recovered from domestic and mortuary contexts. Although there is some extraordinary evidence that vessels or recycled large vessel neck fragments were used for processing or cooking (Amuedo, 2012; Greco et al., 2012; Tarragó et al., 1999), in most cases there is no evidence of soot or wear patterns resulting from exposure to heat. In addition, *Santa María* and *Belén* vessel morphologies are especially well suited for storage, given their large capacity, heaviness that inhibits transport, thick walls, robust bases, wide necks, everted lips designed to cover the mouth with textiles or animal hide (Orgaz, 2014). Palamarczuk (2002) has also proposed that vessels may have been used for water storage, given the high porosity of the pastes and wide neck that allows easy access to the content, possibly aided by bowls or ladles.

Although morphological and use-alteration analyses provide important information on potential vessel use, direct evidence of use can be obtained by organic residue chemical analyses (Skibo, 1992). Organic residues resulting from culinary activities such as preparation, storage, transport and service of foods and beverages can be well preserved in the porous matrixes of ceramic containers (Copley et al., 2005). Absorbed lipid residues are complex mixtures formed by the container's multiple uses during its life history (Evershed, 2008). Residues can be the unintentional result of culinary activities, or they can be the result of intentional coating of inner surfaces in order to seal pores and avoid evapo-transpiration of liquids (Deboer, 1974; Henrickson and McDonald, 1983; Schiffer, 1990; Skibo, 1992). Both types of residues may form palimpsests that can be difficult to interpret. The characterization of lipid residues has been successfully achieved by gas chromatography–mass spectrometry (GC–MS) (Colombini and Modugno, 2009; Evershed, 2008).

In this paper we explored the use of vessels (*tinajas*) from non-funerary contexts in three case studies selected from the valley area of Catamarca province, in Northwest Argentina (Fig. 1). The aim of this preliminary study was to explore organic residues preserved in ceramic matrixes of vessels as potential indicators of culinary uses. All three case studies shared the fact of having been found in domestic floors and of showing no clear use-wear patterns that could signal culinary use, beyond the context of recovery. As a consequence, residue analysis was imperative to obtain evidence of their potential use as containers. This study is, to the best of our knowledge, the first to carry out organic residue analysis on non-funerary *Santa María* and *Belén* vessels.

2. Case studies of non-funerary vessels from Catamarca, Argentina

The first case study is from the site Fuerte Quemado-Intihuatana in the northern section of Yocavil valley, at an altitude of 1900 m.a.s.l. (Fig. 1). The Yocavil valley is part of the Calchaquí valley system that is defined by the Sierra del Cajón mountainous chain to the West and the Calchaquí and Aconquija ranges to the East. The Santa María river runs along the valley North to South, and on each margin there are numerous alluvial cones from tributary streams that run into the main drainage system (Ruiz Huidobro, 1972). The site is defined by a group of buildings covering a total area of three square kilometers, and divided into six sectors. Sectors I, II, III, V, and VI were built during the Late Intermediate period (11th to 15th centuries AD), while sector IV was built during the Inca period (15th and 16th centuries AD) (Kriscautzky, 1999). The sample we selected for the case study was recovered during excavations in the 1970s and 1980s in Enclosure R-51 of Sector V (Fig. 2a). It is a spacious elliptic building made from well finished stone walls, and it has no direct access in or out. A functional study of the architectural features and ceramic assemblage suggested that this space, also occupied during the Inca expansion, was used for private commensal practices within a local elite residence (Orgaz, 2014). The selected vessel (V1) is *Santa María* style, carefully decorated in a bicolor design (black paint on cream-white slip). The recovered portion of the vessel is from the neck area, and it shows a geometrical serpent-like design which probably was part of the lateral panel (Fig. 3 a). This container has no evidence of soot in its outer surface, and it has some marks of wear in the inner surface.

The second case study is from El Colorado, a locality in the southern section of the Yocavil valley that covers approximately 60 ha, where the evidence of occupations are distributed between the piedmont and the alluvial plain of Santa María river (Fig. 1). The site was inhabited during a long period of time by small-scale agropastoralist groups from the Early period to the present. A small cluster of buildings located in the North Sector is composed by structures with Late period architecture (Palamarczuk, 2016). Within this cluster is Detection 2, a residential place composed of a minimum of seven enclosures. An intramural excavation in an extended area was carried out in one of them (E3; Fig. 2b), recording a sequence of occupations of the structure that reach to Early Colonial times[1]. Fragments of a *Santa María* tricolor style vessel (black and red paint on cream-white slip) fractured *in situ* were found at a depth of 70 cm from the current surface lying on the initial occupation floor of E3, near a hearth. A sample of charcoal was dated using AMS obtaining a result of 624 ± 20 yr BP (YU-4564). The vessel (V2) fragments belong to the body, neck and lip, and they have no evidence of soot or other marks on their surfaces (Fig. 3b).

The third case study is from Mishma 7 site which is located in the Fiambalá valley (Sempé, 1984) (Fig. 1). The site has two large groups of buildings made up from various enclosures and surrounded by a perimeter wall. The site has a total surface area of 200 m^2. Investigations were carried out during the 1970s (Sempé, 1984) and 1990s when the occupation was dated between 1405 and 1573 AD[2] (Ratto, 2013). Ceramologic studies showed the coexistence of Late Intermediate and Inca material culture (Orgaz et al., 2007). The sample selected for this case was found in Structure A, a rectangular enclosure measuring 9.5 m length and 4 m width, lying on a floor at 60 cm below surface level (Fig. 2c). The archaeological context of this floor included hearths, burnt animal bones, plant remains and ceramic fine ware (Inca, Belén, Abaucán and Sanagasta styles) as well as ordinary cooking ware. Structure A was the only enclosure at the site where Inca style ceramics were recovered. Sempé (1984, 1976) believed that Structure A was used for storage of food and other organic materials. The sample included in this study is a fragment that belongs to the body of a *Belén* style small vessel (V3), with bicolor decoration (black paint on red slip) (Fig. 3c). It has no evidence of soot.

3. Materials and methods

Lipid extraction was carried out on archaeological samples V1, V2, and V3. In addition, reference samples of typical plant and animal food resources rich in lipids from pre-Hispanic Catamarca valleys were studied for comparative purposes.

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