

# Ceramic production in the northwestern Iberian Peninsula: studying the functional features of pottery by analyzing organic material

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**ABSTRACT** In this article we offer a preliminary interpretation of analytical results of organic material taken from pottery found in eleven sites in Galicia, in the northwestern Iberian Peninsula. The sites are from different chronological periods, ranging from the Late Neolithic until the Galaico-Roman period. We start with a short presentation of the contexts,

then a summary of the ceramic materials, and finally present the results of the analyses. The ceramics were studied applying the theoretical and methodological concept of the *Technological Operative Chain* (Cobas and Prieto 2003). This is the first time that an investigation project of this type and scope has been carried out in Galicia.

## 1. Introduction

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Our main objective is to characterise the ceramics and their specific or functional uses over a lengthy period of time (from the Neolithic until the Galaico-Roman period), making use of available information: contextual knowledge (descriptions of the sites), formal knowledge (the production process used) and analytical information (results from the analyses of organic materials).

We are in the process of studying the ceramic materials by applying the theoretical and methodological concept of the *Technological Operative Chain* (Cobas and Prieto, 2003; Prieto, 2001, 2002). For this reason, the results of the analyses of organic material should be considered as a part of the stages of ceramic production, as a stage of use or disuse. By adding this information to the context of the vessels we may evaluate their function, and observe if there are any significant changes in terms of the consumption and transformation of foodstuffs from Late Prehistory until Roman times in Galicia.

In summary, the formal models — particularly ceramic styles — together with the production and consumption of foodstuffs, undergo transformations according to the patterns of rationality that governed the societies we are studying.

And so, the aim of this study is to include sites from different periods and a relatively large number of vessels from each period, and to bring this information together using a theoretical and methodological perspective (*Landscape Archaeology* and the *Archaeology of Foodstuffs*), although these are the first steps in a long-term investigation project.

We present the results from eleven sites<sup>3</sup> with different uses and from different historical periods: from the Late Neolithic we have a barrow and a nearby area of activity; from the Early Bronze Age we have four sites (two megaliths, a cist and a settlement); from the

Late Bronze Age we have three sites (two settlements, and a ritual or domestic area); from the Late Iron Age we have only one site: a mine connected with a fortified settlement; and from the Roman period we have one, a Galaico-Roman rural site (Fig. 1).



FIG. 1 – Location of sites.

**TABLE 1**  
Study sites.

Site	Local Council	Province	Type of site	Cultural type
Monte de Os Escuros	Silleda	Pontevedra	Megalithic tumulus	Late Neolithic
			Area of activity	Late Neolithic
Forno dos Mouros	Toques	A Coruña	Megalithic dolmen	Early Bronze Age
San Cosme 3	Mos	Pontevedra	Megalithic tumulus	Early Bronze Age
A Forxa	Ríos	Ourense	Funerary cist	Early Bronze Age
Devesa do Rei	Vedra	A Coruña	Open-air settlement	Bronze Age
Monte Buxel	Pazos de Borbén	Pontevedra	Settlement with ditches	Late Bronze Age
Carballeira do Espírito Santo	Silleda	Pontevedra	Village with ditches	Late Bronze Age
Mirás	Ames	A Coruña	Possible burial site	Late Bronze Age
O Peto	Vedra	A Coruña	Mine next to a hill fort	Change of era
Agro de Ouzande	Silleda	Pontevedra	Small rural settlement	Galaico-Roman

A total of ninety-nine analyses were carried out as part of the project on material from eighteen sites (fifty-five ceramic samples, thirty stone items and fourteen sediments). In this presentation we have selected sixty-two samples: fifty-two ceramic items and ten sediments.

We attempted to respect the following selection criteria for samples: (1) The appearance of visible organic remains on the piece. (2) Giving priority to sections most likely to conserve residues, such as the bottom of vessels or their inner walls. (3) Formal variety, attempting to sample both decorated and undecorated ceramics. (4) Giving priority to vessels that may be studied as complete items, as they offer more information than isolated fragments of pottery. (5) Contextual quality, giving preference to pieces from well-documented excavation contexts. (6) The deposits analysed are of interest as they may have been used as containers for foodstuffs.

Different techniques were used to analyse the contents, identify residues and to characterise microscopic residues, chemical and biochemical indicators<sup>4</sup>: microscopic observation using binocular magnifiers, optical microscopes (Olympus BH2), and a scanning electron microscope with incorporated X-ray micro analyzer (EDS) (Hitachi S-23000 and Jeol JSM-840); biogeochemical analysis and the combined technique of gas chromatography/mass spectrometry (Hewlett Packard 5890 and Hewlett Packard 5970) (Jones et al., 1998; Juan Tresserras, 1997; Juan Tresserras et al., 1999; Maya et al., 1999). Work in experimental archaeology and the study of ethnographic materials played a decisive role in obtaining guide samples that have helped to characterise specific products in archaeological sites (Juan Tresserras, 1997).

It is important to note that the largest number of sites and samples are from the Bronze Age. From the samples as a whole, there is a higher percentage of 'negative' rather than 'positive'<sup>5</sup> samples, although nearly all of the sites contain information; only two barrows failed to yield positive results.

## 2. Results

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In the **Late Neolithic** (Fig. 2) the function of the ceramics appears to have been for the preservation and preparation of foodstuffs, implying the contents were held for a short time. The shapes and clays are similar, both in terms of the vessels analysed and the total number of sites. It is important to note that on one hand there is a formal similarity and functional diversity in the ceramics found and, on the other that it is the most remote period in Galicia for which indicators have been documented related to the processing of acorn flour and animal fats for food preservation.

In the **Early Bronze Age** (Fig. 2) we have found the largest number of indicators of organic material. It is the first time that we find the use of beer linked with simple and open vessels for ritual funerary consumption. It confirms the use of wheat as a foodstuff, and the processing of acorn flour from this period. Undecorated cup shapes are documented with different contents: honey/mead, and flour from acorns and wheat. Here we observed a formal similarity and a functional variability.

The same contents of durum wheat have been found in vessels with formal variability: undecorated cups, bowls with bell-beaker decoration and incised bowls. In this case, we detected a possible functional similarity and a variable form. Milk-based products have been found in one bell-beaker vessel that is profusely decorated and is different from the rest of the group.

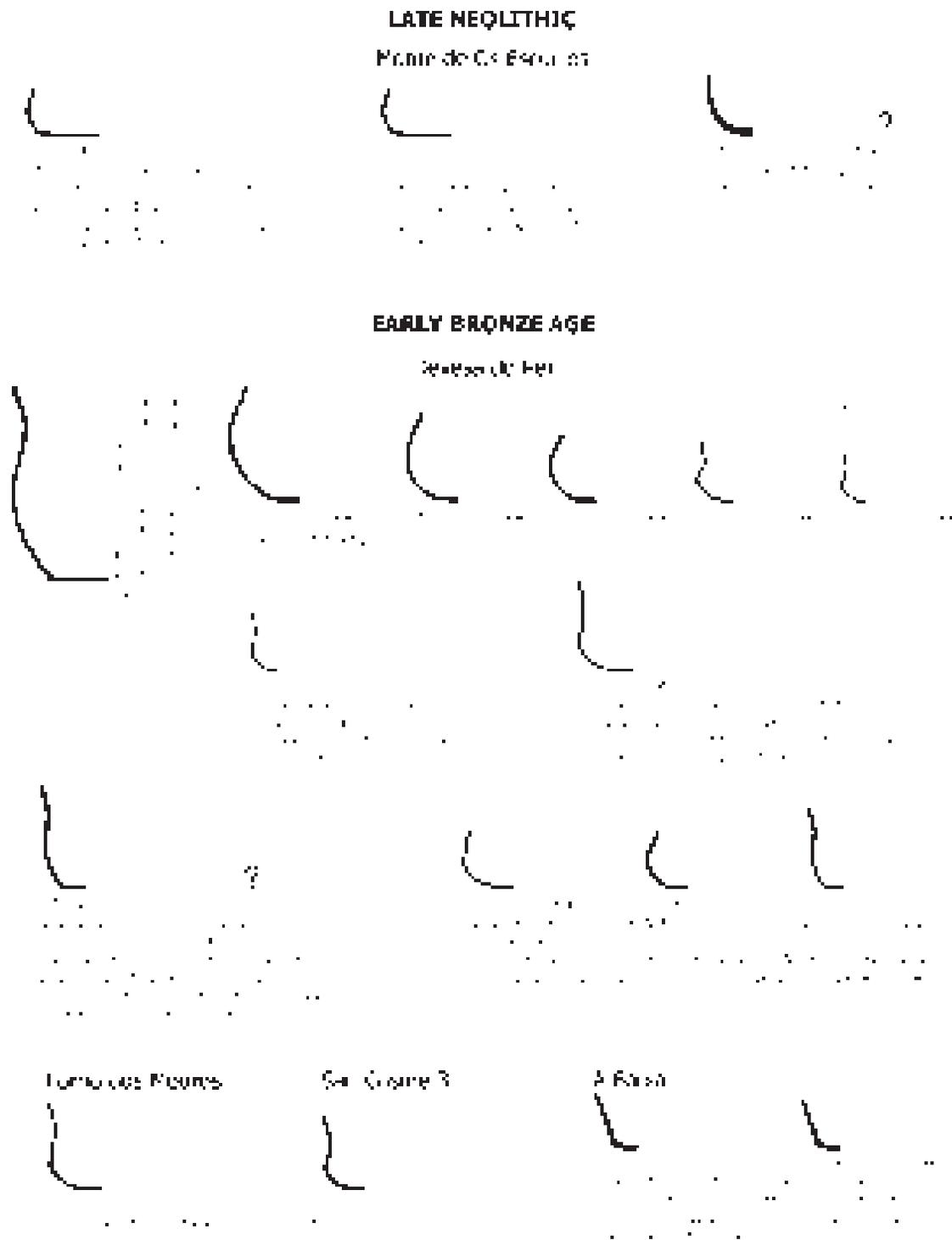


FIG. 2 – Reconstructed and analysed vessels and results of organic material analyses in the Late Neolithic and Early Bronze Age.

This means that Galician bell-beaker pottery may be said to have a degree of functional variability. In some cases, the decorated bell-beaker type is connected with wheat and milk products (in other parts of the Iberian Peninsula, it was found to have been used for beer); in other cases, undecorated bell-beaker pottery was found to have contained acorn flour. The four are basic dietary elements found in societies of this kind.

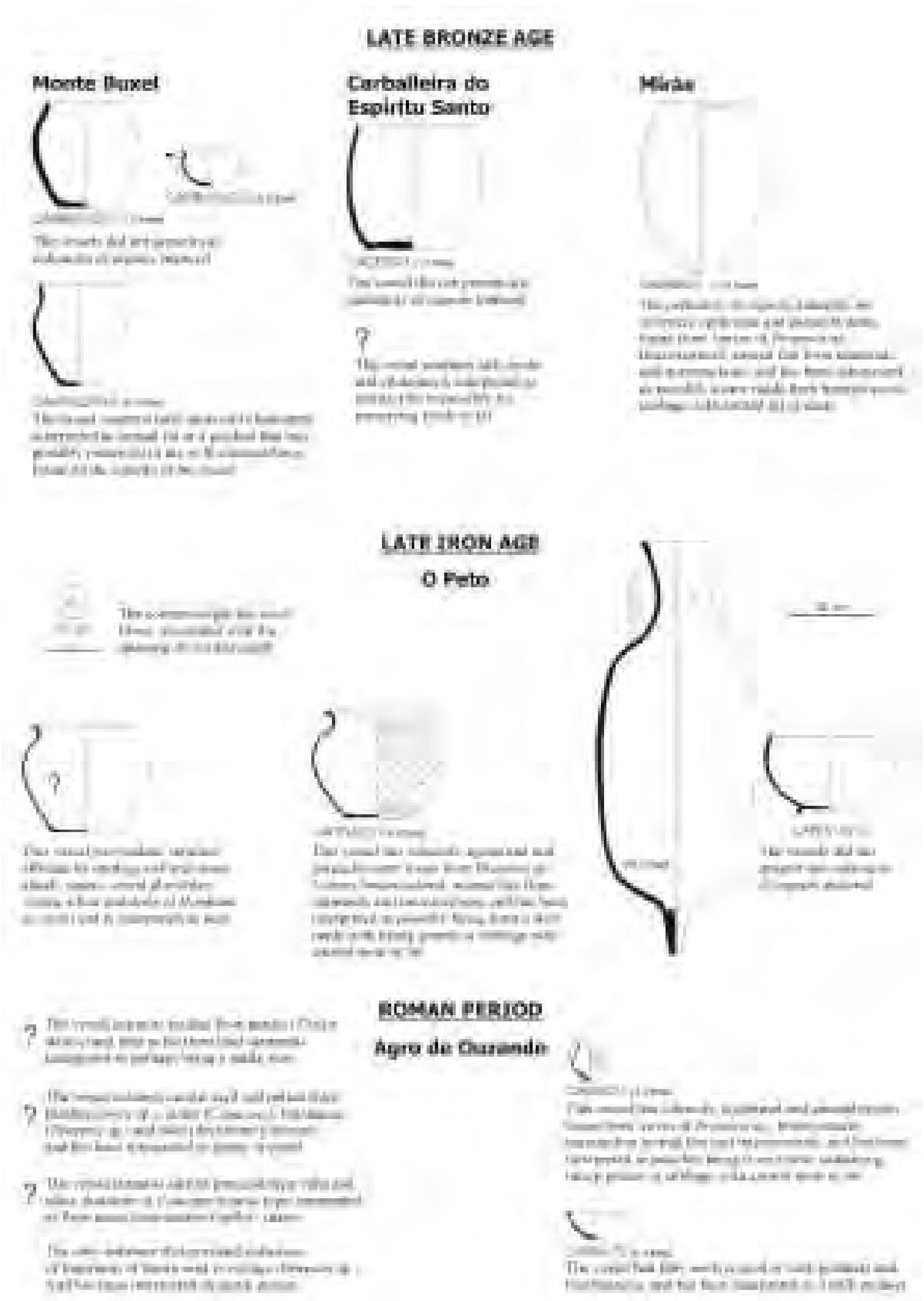


FIG. 3 – Reconstructed and analysed vessels and results of organic material analyses in the Late Bronze Age, Iron Age and Roman Period.

It is also important to note that in the A Lagoa site indications were found of turnip tops or cabbage mixed with animal fat or meat having been contained in a large and undecorated vessel with rough finish. This is the oldest period for which this type of foodstuff has been documented in Galicia.

In the **Late Bronze Age** (Fig. 3) there are few samples with positive indicators, although they are highly varied. A connection may be seen between the sizes of the vessels and their contents: the largest was used for cooking stews with turnip tops or cabbage and animal fat or meat, and the medium-sized vessel for conserving an unknown product in animal fat. The alimentary indicators detected have revealed that some of the products known from previous periods were still consumed. It is also interesting to note that milk products were not only used as human foodstuffs, but also for coating food storage pits in villages.

In the **Late Iron Age** (Fig. 3), formal similarity may be seen in the vessels analysed, with only one having faint decorations, compared to their functional diversity, either for the processing or storage of beer, or for stews with turnip greens or cabbage with animal meat or fat. Unfortunately, the vessels made on a wheel that were analysed did not contain any indicators of organic material<sup>6</sup>.

The **Roman Period** (Fig. 3) is the most informative site in terms of the sample analysed and results obtained, although unfortunately it was not possible to reconstruct many of the vessels analysed.

We can see a differential use of the vessels. On one hand, wheel-made ceramics, the only fine pottery documented at the site, for the consumption of milk-based products or derivatives, and a stew made with turnip tops. On the other, indigenous hand-made pottery, for use before preparing or serving foodstuffs. A nettle stew was documented, which had already been found in the Alto do Castro hillfort from the closing stages of the Iron Age. Certain products consumed in previous periods were still in use, such as honey and mead, milk-derived products and turnip tops. Although the use of millet flour has only been documented in this Roman site, we know that it was consumed throughout the peninsula since at least the Iron Age (Buxó, 1997). Also, the sediment found to be turnip seeds indicates that the dwellers of the site stored some foodstuffs for their own consumption.

### 3. Evaluation

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This stage of interpretation is preliminary, as we do not have any samples from sites earlier than the Late Neolithic, and only a limited number of samples from other periods.

Here there are two issues worth noting: some of the products that became typical foodstuffs in Galicia first appeared in the Bronze Age, such as beer, honey/mead, durum wheat, milk-based products and turnip top stews. However, we imagine that some already formed part of the local diet in earlier periods. Some types of food are detected in Galicia for the first time at the end of the Hillfort Culture period, such as nettle stews and millet flour.

At methodological level, we may extrapolate the following consequences. Analysing the organic material makes it possible to discover what the vessels contained, but does not offer any direct information about their function. The formal characteristics may help to reveal what they were used for, or the processing stage of the foodstuffs within the food production chain. However, the context brings coherence to the group as a whole. The morphology of vessels in general is not necessarily connected with their function: we may find the same type of vessel used for different foodstuffs, or the same product in a wide range of vessels.

The selection stage is essential for obtaining a coherent series of results with positive indicators for organic material, despite only having a limited number of samples. We believe that this investigation gives us a better understanding of certain processes involved in the production, processing and consumption of foodstuffs, in a diachronic manner. It is therefore important to consider that this study only offers a series of preliminary interpretations, and is the first step in a long-term investigation project.

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## NOTES

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- <sup>2</sup> Laboratory of the Archaeological Museum of Catalonia / Cultural Management Programme, University of Barcelona.
- <sup>3</sup> These sites were excavated as part of a series of projects, mainly in connection with the oil pipeline and motorway running from Santiago to Alto de Santo Domingo (Prieto et al., 2002), carried out by the Archaeology Laboratory. This unit was formerly known as the 'Landscape Archaeology Investigation Group' of the University of Santiago de Compostela, and is now the *Heritage, Palaeoenvironment and Landscape Laboratory* (associated with the 'Padre Sarmiento' Institute of Galician Studies, CSIC-Xunta de Galicia).
- <sup>4</sup> With teams from the Archaeological Museum of Catalonia-Barcelona, and the scientific and technical services of the University of Barcelona.
- <sup>5</sup> We use the term 'negative samples' when there are no residues, meaning that no results may be obtained; 'positive samples' are those in which residues are present.
- <sup>6</sup> We also confirmed that woollen cloth was spun in this period, after discovering a weight from a spinning wheel.

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