Characterising the Domestic Economies of the North of Roman Carpetania through Network Analysis

Fernando Moreno-Navarro

1Universidad Carlos III de Madrid

1 Introduction

The main aim of this paper is the analysis of the domestic economies of several rural settlements from northern Roman Carpetania (Central Spain). The application of Network Science has allowed us to characterise the consumption patterns of the inhabitants of these settlements. In this way, we have been able to visualise in greater detail the material repertoire mainly used in these places. The results show consumption patterns like those traditionally associated with peasant communities across history. Furthermore, the application of this type of methodology has also allowed us to compare the level of integration of these settlements’ economies in the existing trade networks in the Roman world. The analyses show a predilection for objects produced from a regional scale. In this paper, we will present preliminary analyses carried out on these settlements within the project ‘Economías domésticas en el norte de la Carpetania romana: condiciones de vida, redes y desigualdad’.

2 Case study

The archaeological analysis of rural areas in the Roman world has traditionally focused on the study of the villae as centres for the articulation of economic and social life. The application of this perspective to the study of the archaeological record and settlement patterns in the rural areas of Roman Hispania has served to overshadow other models of rural habitat. This is the case of the study area on which this work focuses: the north of Roman Carpetania. It is a region in the centre of the Iberian Peninsula that mainly coincides with the Madrid basin, which previous historiography and several ancient authors (Str. 1,6; Apiannus Iber 6,64) have characterised as an eminently rural

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From the beginning of the XX century, the archaeological research about this region has centred its attention on the discovering and study of several monumental villae like Carranque (Toledo) (Arce, 2003; Fernández Galiano, 1995; García-Entero et al., 2012), El Val (Alcalá de Henares) (Rascón et al., 1991; Sánchez and Rascón, 2006), or Valdetorres del Jarama (Arce et al., 1997).

However, a large number of archaeological rural sites have been discovered thanks to several systematic survey projects (Azcárraga, 2015, 179-183) and the discoveries generated by commercial archaeology in relation to the exponential urbanistic development of the metropolitan areas in recent years. These new sites differ from the traditional Catonian villa framework (Azcárraga, 2015; Baquedano, 2017; Bermejo, 2017). All the analysed sites are part of the Madrid basin, corresponding to the plains formed around the river basins that flow down to the Tagus River from the mountains of the central system. These rivers – Guadarrama and Jarama – as well as their tributaries, form very fertile plains and terraces, ideal for agricultural exploitation, most probably cereals, vines and olives in Roman times. This is possibly one of the reasons why most of the archaeological sites are located around these river courses.

Thanks to various textual sources such as Pliny the Elder (Nat. III 24-25), we know that the territory of the region was articulated around three municipia: Complutum, Titulcia and Mantua. However, we are only certain of the location of the first one. The Antonine Itinerary and the Ravenna Cosmography (Gamallo and Gimeno, 1990; Mangas et al., 2017) shows that the region was crossed by at least two of the main roads linking the capitals Caesaraugusta and Emerita Augusta. However, several authors (Carreras and Soto, 2013; De Soto, 2019; Scheidel, 2014) have shown that the centre of the peninsula is a mainly peripheral region in terms of transport costs, both from Rome and from other important points in the Roman world.
3 Methodology

Based on the systematic analysis of all this archaeological evidence this study aims to address the study and characterisation of the domestic economies of these peasant settlements. In the context of our project, we sampled the material contexts of a number of archaeological deposits documented at 8 sites in the study area with at least 1500 findings following a household archaeology methodology.

One of the objectives of this work is to characterise the consumption patterns developed by the people who inhabited or built these sites. Using network analysis we will be able to visualise in greater detail the repertoire of objects most commonly consumed at these sites and throughout the territory. Based on these inferences, we tried to verify whether the consumption patterns of these settlements could be similar to those traditionally linked to peasant communities in other historical periods (Chayanov, 1966; Quirós, 2020; Quirós and Tejerizo-García, 2020; Sahlins, 1972). In recent years, Roman archaeology has begun to develop study perspectives inspired by peasant studies to characterise the ways of life of these communities (Bermejo, 2017, 2018; Bowes, 2021; Ghisleni et al., 2011; Reddé, 2017).

Network Analysis allows us to discuss the models with which historiography has traditionally conceived the Roman economy. For this reason, we also analysed how the networks established at a local scale between household economies could be integrated into interprovincial economic networks. In the case that the networks show mostly local exchange patterns, we can deduce that the economy of these settlements was dominated by local families and associations that controlled information and supply flows, similar to the ‘bazaar economy’ model (Bang, 2008). On the other hand, in the case that the patterns tend towards interregional scale exchange, we can deduce that these economies were part of a wider, interconnected market, similar to that proposed by some neo-modernist historians of the roman economy like Peter Temin (Temin, 2013). As analyses often do not yield such conclusive results towards a certain position, it will be necessary to explore new frameworks.

We choose Network Science due to its versatility and its ability to characterise complex systems as a whole. These tools can analyse any kind of relationship between different elements such as those existing between the various components of the archaeological record. In our case, most of the types cannot be ascribed to a specific place of production. We classified the objects into different scales of production: local, regional and interregional.

On the first hand, we carried out co-presence analyses (Brughmans, 2010; Collar et al., 2015; Fengnet et al., 2017; Mills, 2016) of the productive typologies (Fig. 2) and the object shapes (Fig. 3) in all sites. This model consists of a unimodal network linking the different productive typologies. Two typologies or two shapes are linked if they share at least one site where they are present. The strength of this link is determined by the number of objects of that typology or shape, and the number of sites in which they are found. In the case of typologies, the geographical variable is represented by the colour code.

We have also measured the centrality of the nodes. The centrality measures determine the importance of each node taking into account its position in the network. In our case, we have used PageRank (Brin and Page, 1998). This variable calculates the importance of the nodes by taking into account the relevance of their neighbouring nodes, their number of links, and penalising those nodes that have fewer links. However, PageRank adds a randomness factor that can be a determining factor in the
Figure 2: Uni-modal network representing the fabrics linked to each other according to the deposits they share. The tone of the nodes represents their geographical variable of origin. The size of the nodes is determined by their PageRank value.
Figure 3: On the left, a unimodal network representing the shapes linked together according to the deposits they share. The size of the nodes is determined by their PageRank value. On the right, some of the most representative material repertoire of the peasant settlements in this region: 1) TSH bowl (Cuenco) Hisp. 37 shape, from the site of La Huelga (inv. no. 02/40/40/79.21/6/7027/9). 2) Cooking pot (Olla) from El Guijo (inv. no. 02/38/79.21/19/127/43). 3) TSHB dish (Plato) Caballero-Juan 9 shape, from Arroyo Paeque site (inv. no. 07/19/4101/5). 4) Iron nail (clavo) from the site of El Guijo (inv. no. 02/38/79.21/19/511/2). Drawing by Jesús Bermejo and Fernando Moreno-Navarro.
analysis. This centrality measure has been used in archaeological analyses in different contexts (Brookes and Huynh, 2018; Dubbini and Gattiglia, 2013).

In order to detect patterns of similarity and differences between settlements, and within the sites themselves, community detection has been carried out using modularity (Fortunato, 2010; Newman, 2010; Radivojević and Grujić, 2017). In this case, the analyses are still in progress, so the results we will show during the presentation are still preliminary. This type of analysis will allow us to go deeper into the structures of the co-presence networks. In this way, we will be able to talk about the integration or segregation of peasant settlements within the economic networks of the Roman world.

4 Results

The analyses show that the peasant settlements in this region mainly used objects from a regional market and that there was also a significant presence of objects produced in the surroundings of domestic spaces. The distribution shows us a clear core with four dominant productions. TSH (Hispanic Terra Sigillata) is the most prominent typology. The number of objects produced in the local environment is not negligible either. This is the case of the cooking pots among other typologies. The productions made in the environments of the domestic spaces are usually objects destined for the subsistence of the people who live in those households. Therefore, their relevance may be indicative of a consumption repertoire similar to those traditionally linked to peasant contexts. The analyses also show the exceptionality of imports from other provinces of the Empire. The presence of these imported objects is merely testimonial, but may be indicative of the integration of these settlements into larger trade networks. However, the scarcity of these finds shows the difficulty of access to these products, either for economic reasons or because of an inefficient economic network with a low level of integration.

The repertoire of consumption wares at the analysed sites is made up of a small number of types (Bermejo, 2021). The most commonly used object shapes are bowls, pots, plates and nails. In the pattern, the shapes tend to remain more closely united in the case of being more shared. All those that form the core of the graph constitute the basic repertoire of objects most commonly used in the study area. The characterisation of site consumption patterns in the study area is consistent with a picture far from the complex patterns detected in other elite settlements sampled following the same methodology (Bermejo et al., 2019; Bermejo and Quevedo, 2014). The small number of shapes and the recurrent frequency of some of them suggest the use of the most versatile types of everyday use. This pattern departs from the cultural revolution detected in the consumption practices of other Roman-period contexts (Wallace-Hadrill, 2008, 319-329), which required the use of multiple formal varieties to fulfil the complex social rituals in which the Roman elite participated. The regional Terra Sigillata production centres had a wide variety of types at their disposal. However, the inhabitants of these settlements chose only their most versatile shapes.

References


