Landscapes and the Augustan Revolution

The Transformation of the Western Provinces between the Republic and the Early Empire

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Chapter 6
Landscape Transitions in Tarraco (Tarragona, Spain)

Further Understanding of Provincial Communities and their Integration into the Roman Empire

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6 Landscape Transitions in Tarraco (Tarragona, Spain)

Further Understanding of Provincial Communities and their Integration into the Roman Empire

María del Carmen Moreno Escobar[1]

Introduction: Historical Context and Research Question

In a volume like this which is focused on exploring the impact of the Augustan Revolution on the western provinces of the Roman Empire, a special place must be dedicated to the case of Tarraco (modern Tarragona) and its territory. This is not only due to the confirmation by Augustus of the town's status as capital of the province *Hispania Citerior Tarraconensis*[2] after the provincial reorganisation of Hispania,[3] but also because of Augustus' visits there—first in 45 BCE to meet Caesar and then during the Cantabrian Wars between 26 and 25 BCE when he received his eighth and ninth consulships. This latter visit could have acted as an incentive to Tarraco's community to further enhance their links and integration within the Empire.[4] Such a close relationship is further attested by the delegation of Tarraco's citizens which, after Augustus' death, visited Rome in 15 CE to petition Tiberius to allow the construction of a temple dedicated to Augustus in the town, which the emperor granted.[5]

The emperor's stay in Tarraco should be viewed as more recent evidence of a close relationship between Rome and Tarraco that had much older roots, as this town had played a fundamental role in the expansion and consolidation of Roman control of Iberia from the late third century BCE. Beginning during the Second Punic War, the Iberian settlement at the mouth of the *Tulcis* river (modern Francolí) saw the installation of a permanent Roman

1 This research is part of the project 'Beyond ports: movement and connectivity in the Roman Mediterranean', funded by the Swedish Research Council (grant application: 2020-01621).

2 A role this town already played in the Republican period as discussed (e.g.) by Prevosti Monclús (2010).

3 Traditionally placed in 27 BCE, although recent research has proposed a later date between 16 and 13 BCE, coinciding with his third visit to *Hispania* (Abascal Palazón 2006).

4 Abascal Palazón (2006).

5 Tacitus (2017), *Annals* 1.78.

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military contingent on the hill that dominated the natural harbour, which became the winter headquarters of the Roman army in Iberia for much of the conflict. At the end of the war, this Roman presence developed into a dual occupation of the area—in a military capacity at the top of the hill with the construction of the *castrum* and then in a civilian capacity at the foot of the hill in close proximity to the Iberian settlement and harbour. Tarraco thus became a strategic location and entry point in Hispania for the Roman armies fighting in the northern half of the Iberian peninsula, as the later development of the road infrastructure shows (Figure 6.1) with Tarraco situated at the crossroads of the *Via Heraklea* (later renamed Augusta) and the *Via de Italia in Hispanias* (see España-Chamorro's contribution in this volume, Chapter 1). Interestingly, numerous silo structures have also been identified and excavated within the confines of the Roman town.[6] Dated to the second century BCE and destroyed around 100 BCE during the re-urbanisation of the Republican city, these silos highlight Tarraco's possible role as a logistical supply centre as well as the use of its harbour in the transport of goods stored in the silos plus other goods. The fulfilment of these new functions also brought substantial transformation to

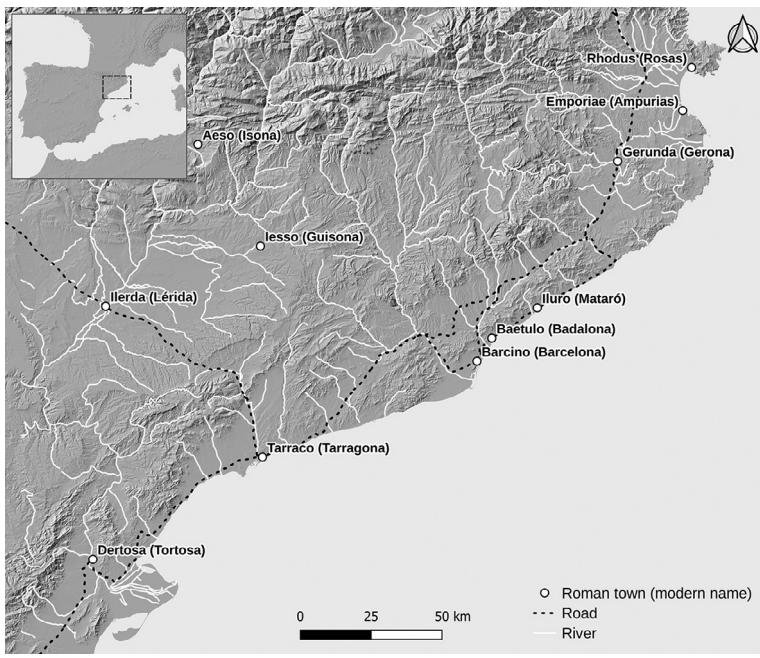


Figure 6.1 Location of Tarraco in the territorial context of north-east Hispania at the beginning of the Imperial period
Source: Made by M.C. Moreno Escobar.

6 Terrado Ortuño (2019) 313.

Tarraco's countryside. In contrast with the high degree of continuity in the rural occupation between the Iberian and Republican periods identified by earlier research, a more recent focus on the Baix Camp has identified how many Iberian *oppida* in this area were progressively abandoned whilst more rural settlements began to appear in Tarraco's territory during the second century BCE.[7]

From the end of the second century BCE, the Roman settlement underwent a transformation of its organisation and appearance with new urban infrastructure such as walls delimiting the town, the formalisation of street and sewer networks, and a forum.[8] Further developments are also observed in the port area with an extensive effort to improve ground drainage prior to the construction of new port infrastructure (e.g., *horrea*).[9] Further changes were also occurring outside the town itself with the implementation of several centuriation networks on the landscape (particularly Tarraco I, II, and III). Although the specific chronology is still under debate with dates ranging from the second century BCE to the mid-first century BCE, the identification of the spatial relationships between these centuriations, the town's new street network, and the restitution of the *auguraculum* at Tarraco suggests all three were coetaneous.[10] Correlations have also been established between the centuriation of Tarraco's territory and rural occupation heterogeneously distributed across the *pertica*. Some of the rural settlements are in alignment with the centuriated axes and may have originated in the late second century BCE.[11] Regardless of their specific chronology, the expression of Roman values is clear in these changes on the landscape of Tarraco.

From the mid-first century BCE onwards, transformations increased in both town and territory, highlighting the transition of the role of Tarraco from strategic and military (as the entry point to northern Hispania) to a symbolic and administrative centre (as provincial capital). Evidence for this includes the change of character of the maritime port area, focusing more on trade and services from the Augustan period, the general monumentalisation of the town culminating in the construction of the terraced public areas under Vespasian, as well as an increase in rural occupation at the beginning of the Flavian period.[12]

However, some comments must be made about these interpretations, particularly since they are built upon the recent Ager Tarraconensis project, which focused on the area west of the Francolí river and has generated a vast

7 On the continuity, Carreté et al. (1995) 276–7; on the progressive change during the second century BCE, López Vilar et al. (2011).
8 Mar et al. (2012) 196–8.
9 Terrado Ortuño (2019) 311–14.
10 On the chronology of the centuriation networks, Palet Martínez (2003); (2008); Palet Martínez et al. (2010b); on their spatial relations, Palet Martínez et al. (2010a).
11 Palet Martínez and Orengo Romeu (2010).
12 On the modification of the port area, Terrado Ortuño (2019) 316; on the monumentalisation of the town, Rodà (2016); on the rural occupation, López Vilar et al. (2011).

archaeological corpus of data with a much higher temporal and archaeological resolution than what is available for other areas around Tarraco. As a result, some questions remain unresolved, particularly about the nature and characteristics of the occupation dynamics developed in the area east of the Francolí. In this sense, it is fundamental that we acquire an understanding of the local communities of Tarraco, both urban and rural, that lived in and transformed the town's territory and, in this way, gain new insights into their historical development in connection with their integration into the Roman Empire.

One way to investigate these questions is through the exploration of how local communities related to and used the landscapes they inhabited and the variations and continuities in these relations over time. The present contribution will examine the occupation of Tarraco's hinterland as a means to understand how people changed, if at all, the way they related with their immediate surroundings and if these changes can be linked with the wider phenomenon of the Augustan Revolution that is the main focus of this volume. To this purpose, this work focuses on the occupation of Tarraco's territory, defined by the intersection of the areas studied by previous research, from the beginning of the first century BCE to the end of the first century CE.[13] To identify continuities and changes in the ways local communities related to and used their surroundings, this timeframe has been divided into three phases to delineate Republican, Augustan, and post-Augustan periods:

- Phase 1—the first half of the first century BCE;
- Phase 2—from the mid-first century BCE to the end of the reign of Augustus (14 CE);[14]
- Phase 3—14 CE to the end of the first century CE.

This contribution focuses on the discussion and analysis of the archaeological evidence available for the study of Tarraco's countryside and will propose several hypotheses about its changing occupation across these periods. A more thorough study of these hypotheses will be developed in a future work utilising the application of topographic modelling and spatial analysis within a GIS-environment as a means to explore the dynamics of continuity and change experienced by Tarraco's local communities.

13 Particularly, Carreté et al. (1995) and Prevosti Monclús and Guitart i Duran (2011).

14 The years between the beginning of the Civil War between Caesar and Pompey (mid-first century BCE) and the beginning of the Augustan period (27 BCE) represent a transitional period that is difficult to define archaeologically using the material evidence. For this chapter, I have divided Phase 1 and Phase 2 at the confirmation of Tarraco as the provincial capital by Octavianus, which is commonly understood as the event that starts off the transformation of Tarraco and its countryside.

Previous Research: Building the Dataset

As is to be expected, the history of research on ancient Tarraco's territory has had a profound impact not only on what evidence is currently available, but also on how this area and its historical development have been interpreted.

The first systematic attempt at analysing the rural habitation around Tarragona in antiquity was undertaken by Simon Keay, Martin Millett, and Josep-María Carreté in the 1980s and early 1990s and whose resulting publication remains a milestone in Roman archaeology research in the region.[15] This project (referred to as 'Tarraco's hinterland' from here on) combined the archaeological information on the known sites in the hinterland of Tarraco; the systematic survey of extensive areas in the countryside of Alt Camp, Baix Camp, and Tarragones (understood as Tarraco's territory in Roman times); and the analysis of the material evidence gathered during their fieldwork seasons. Using these combined data, the project proposed the first interpretative model for the changes that occurred from the Iberian period through to Late Antiquity. The project's hypotheses and methodological approaches have become a template for later projects and research initiatives in the region. Furthermore, the way in which the results of the project were published, combining the publication of a volume with the curation of its resources (e.g., maps) in the online repository of the Archaeology Data Service,[16] has ensured the possibility of reusing these data in later research into the area.

Later, the Ager Tarraconensis project, led by Marta Prevosti and Josep Maria Guitart, developed a similar methodological approach to the analysis of Tarraco's hinterland, but with a stronger focus on the area to the west of Tarraco. This research initiative resulted in the publication of several volumes about different aspects of the archaeology of the region in the Roman period, such as the general contextualisation of the region in antiquity, its epigraphic record, and (more relevant for this contribution) the settlements in its hinterland from the Iberian period to Late Antiquity.[17] The compilation of evidence from varied sources (publications, archives, museums, private collections, etc.) into a single resource and integrating it with the results of extensive field surveys and site visits created a comprehensive research resource (structured as a geodatabase and an associated Geographic Information System) that, regrettably, has still not been published. However, the detailed publication of the project's results has indirectly made the data available for other researchers to use.

Over the last decade, new lines of research have developed, such as the role played by the port of Tarraco in antiquity,[18] and the creation and development

15 Carreté et al. (1995).
16 Keay and Millett (2003).
17 On the general contextualisation, Prevosti Monclús and Guitart i Duran (2010a); Prevosti Monclús et al. (2013); on its epigraphic record, Prevosti Monclús and Guitart i Duran (2010b); and on the occupation of its territory, Prevosti Monclús and Guitart i Duran (2011).
18 Lasheras González (2018); Terrado Ortuño (2018).

of its port system which has been explored in a partnership between the Catalan Institute of Classical Archaeology (ICAC in its Spanish acronym) and the Portus Limen project through geophysical and geoarchaeological surveys.[19] This line of research is also expanding to other coastal areas in north-western Spain thanks to both underwater and littoral occupation evidence from the Roman period, thus complementing a picture that had so far focused solely on the terrestrial landscapes of Tarraco.[20] More recently, a more comprehensive research approach is intending to integrate both terrestrial and maritime evidence in order to offer a more holistic understanding of the development of the region during the Roman period.[21] The present contribution falls within this latest line of research aimed at exploring the changing relationship of communities with their land- and seascapes as a means to understanding the changes associated with their integration into the Roman Empire.

Despite their differences in objectives and temporal and geographical scopes, the combined contributions of the Tarraco's hinterland project and the Ager Tarraconensis project, together with the continuing work on other aspects of the archaeology of Roman Tarraco and its hinterland by ICAC, have made Tarraco and its hinterland one of the best-understood regions in Roman Hispania.

The data used in this work have been integrated into a geodatabase of published archaeological information, and data gathered from a variety of publications.[22] These data were then compared with the information held at the regional inventory of sites for Catalonia,[23] a time-consuming task that nonetheless allowed further refinement of their archaeological site characterisation and accurate spatial location of the archaeological evidence. The area under study was defined as the combination of the regions analysed by the Tarraco's hinterland and Ager Tarraconensis projects (Figure 6.2), whose similar methodological approaches made possible the integration of both datasets to advance a greater understanding of the communities inhabiting Tarraco and its territory on both sides of the Francolí river. This work resulted in the identification of 226 sites that were occupied in the temporal framework defined for this project (i.e., beginning of the first century BCE to end of the first century CE).

19 Lasheras González and Terrado Ortuño (2018); Salomon et al. (2015a); (2015b); Strutt (2018).

20 On the underwater evidence, see Pérez Martín (2007); on littoral occupation, Terrado Ortuño (2020).

21 Moreno Escobar (2020).

22 Including research monographs, e.g., Carreté et al. (1995) and Prevosti Monclús and Guitart i Duran (2011); compilation works, e.g., Pérez Martín (2007) and Terrado Ortuño (2020); and excavation and field reports, e.g., Ciurana Prast (2008); Sentís Carazo (2008); Vila Fàbregas (2008); and Díaz García and Ramírez Roldán (2015).

23 Generalitat de Catalunya (2017).

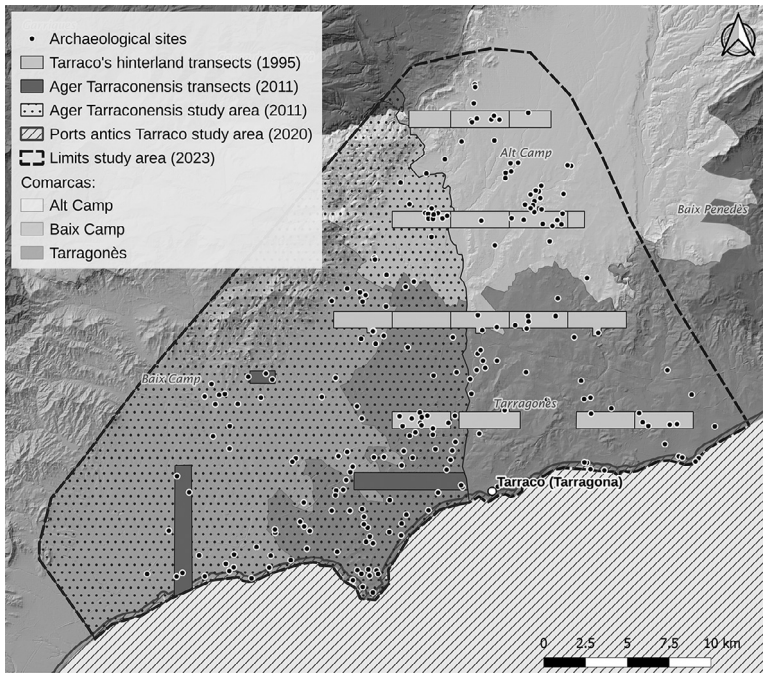


Figure 6.2 Limits of the regions ('comarcas') and study areas defined by the projects mentioned in this section, transects of field surveys carried out by the different projects, and distribution of archaeological sites across the area under study in the present work
Source: Made by M.C. Moreno Escobar, after several sources.[24]

The diversity of sources employed in this data collection highlighted the heterogeneous nature of the information available for each individual site and their very different histories of research.[25] Furthermore, this data compilation also showed differences in the intensity of study across the region (Figure 6.3, above) as well as the variety of methods employed to study these sites (Figure 6.3, below).

In such a heterogeneous dataset, the diversity of approaches applied by each project and research initiative could potentially have unexpected effects when analysing these data as a unit. For example, the possibility of ascribing different temporal or functional categories to sites that present similar material assemblages but were studied by different research teams and which might not have necessarily followed identical definitions or criteria for the

24 Carreté et al. (1995) 40, Fig. 3.1; Prevosti Monclús and Guitart i Durán (2011) 40, Fig. 2; and Terrado Ortuño (2020) 20, Fig. 1.

25 e.g., some sites had been thoroughly investigated, such as La Canaleta, ID 15501, and Els Antigons, ID 15695, in contrast with others not so well explored and understood, e.g., Punta de la Llança, ID 15797.

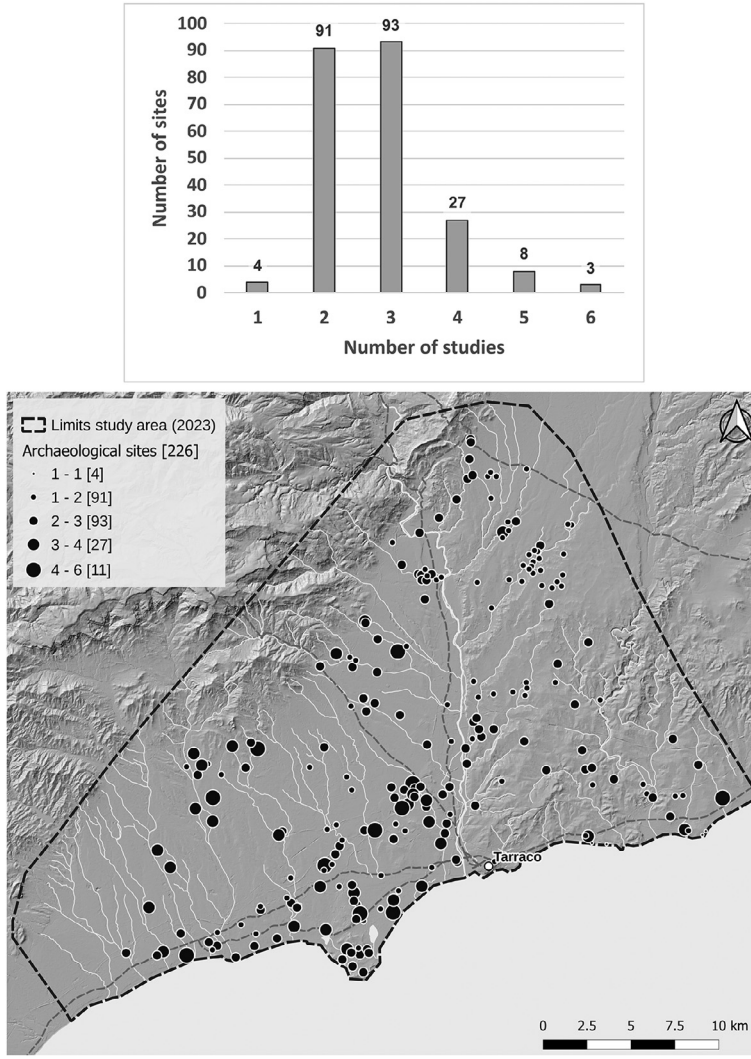


Figure 6.3 Above: Number of sites classified by the number of studies and projects that have explored them. Below: Distribution of sites according to the number of studies and/or research projects that have explored them
Source: Made by M.C. Moreno Escobar.

classification of the archaeological evidence. To mitigate these issues, all sites contained in the database were re-evaluated with a common standard developed by the author for both chronology and functionality that was based on the interpretation of the archaeological data gathered during the data compilation described earlier. For this purpose, two sets of criteria were developed:

- **Chronology**: this is aimed at clarifying the temporality of the sites' periods of activity, relying primarily on the identification of ceramic types found on site and their chronological ascriptions, using the Roman Amphora resource and the volume by M. Roca Roumens and M.I. Fernández García as the primary guides.[26] Other archaeological evidence used for dating site activity included coins, sculpture, architectural decoration, and construction techniques. Utilising these data, each of the three phases analysed in this work was defined by specific types of material evidence. For example, the presence of Campanian ware and Dressel 1 amphorae identified Phase 1 (Late Republican period, 99–50 BCE), TSI and Dressel 2–4 amphora for Phase 2 (Augustan period, 49 BCE–14 CE), and TSSG and TSH and Dressel 20 amphorae for Phase 3 (early Imperial/post-Augustan period, 15–99 CE).
- **Function**: criteria for defining the functionality or type of occupation represented at each site. This work distinguishes 14 types of sites based on the interpretation of the archaeological evidence compiled which includes finds and structural remains (Table 6.1). This process of data re-evaluation also enabled the identification of changes in the forms of occupation of sites, such as the transition from farms or undefined settlements to high-status settlements.

It is also important to address the impact that methodological approaches to data have on the identification and characterisation of sites. It is a well-known fact of archaeological research that the different methods vary greatly in the time and resources needed in their application as well as in the level of detail and resolution of the information they generate. These factors are briefly summarised in Table 6.2. For Tarraco's hinterland, the majority of the evidence collected comes from field survey and analysis of the surface finds (176 sites, 78% of the total number), with excavation coming in second (50 sites, 22% of the total) and geophysical survey placing last (5 sites, 2% of the total) (Figure 6.4). Looking at both the total numbers and the percentages of sites explored using each method across the three phases, we can see an increase in the number of excavations for sites present in the high Imperial period, a potential piece of indirect evidence of the traditional bias towards exploring the early Imperial phases of occupation to the detriment of earlier and later historical periods in classical archaeology. Examining the distribution of these activities, we can also observe that excavations have been particularly frequent in the area west of the Francolí river and in the vicinity of the coast, which together with the different intensity of archaeological explorations across the region (Figure 6.3) point to the impact the Ager Tarraconensis project has had on the history of research in this region and at a potential data bias in the archaeological knowledge of Tarraco's hinterland on either side of the Francolí river that needs to be accounted for when interpreting its historical development. In contrast, field survey has

26 University of Southampton (2014); Roca Roumens and Fernández García (2005).

Table 6.1 Landscape and site typology used in this study with criteria defining each

Landscape use	*Site type*	*Definition*
Residential occupation	Town	Large surface area, presence of urban infrastructure (e.g., city walls, public buildings, sewers), inscriptions attesting to the existence of a community of citizens (*ciuitas*).
	Vicus	Medium-large surface area, presence of building material, evidence for exploitation and/or storage of agricultural resources (e.g., silos, warehouses, *torcularia*, millstones, *pondera*), absence of luxury materials.
	High-status settlement	Medium surface area, presence of building material, presence of luxury materials (e.g., mosaics, architectural decoration, *marmora*), usually accompanied by evidence (finds and/or structural) of exploitation and/or storage of agricultural resources.
	Farm	Medium-small surface area, presence of building material, absence of luxury materials, evidence (finds and/or structural) for exploitation and/or storage of agricultural resources.
	Undefined settlement	Variable surface area, archaeological evidence limited to building material and/or a few types of table/transport ware.
Other types of occupation	Necropolis	Variable surface area; identification of tombs, funerary monuments, and/or human remains.
	Mines and quarries	Evidence of extraction of stone or other materials (e.g., quarry fronts, tunnels, mining infrastructure).
	Figlina	Structural remains of pottery kilns, large concentrations of burnt and/or deformed pottery, infrastructure for decanting clay.
	Dumping ground	Concentrations of archaeological finds without internal coherence or patterning (e.g., different chronologies), absence of building material.
	Castrum	Fortified settlement, strategic location, presence of *militaria*.
	Port	Presence of port infrastructure (e.g., moles, quays, jetties, embankments, warehouses, lighthouse).
	Road infrastructure	Presence of roadway or associated infrastructure (e.g., bridge, *mansio*).
	Water infrastructure	Presence of aqueduct conduit, water reservoirs, large structures with *opus signinum* lining, dams, etc.
	Undefined site	Archaeological find assemblages, indicative of activity but with insufficient information for functional categorisation.

Source: Made by M.C. Moreno Escobar.

Table 6.2 Non-exhaustive description of archaeological research methods

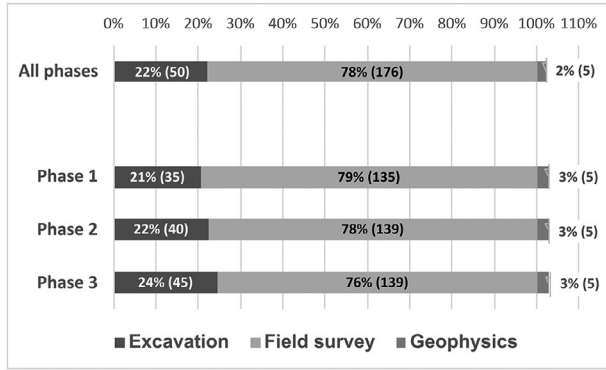
Method	*Time and resources*	*Data returns*
Excavation	Slowest, most expensive	Very high precision and resolution, but limited extent
Field survey (including analysis of collected materials)	Fast, requires a team of surveyors familiar with material evidence	Wider comprehension but more limited data due to problematic relationship between surface and underground evidence
Geophysical survey	Fast, requires specialised equipment	Fast overview of site acquired, but difficult to define chronological development
Other remote sensing methods (e.g., LiDAR, aerial photo interpretation)	Very fast, (potentially) expensive, requires specialised resources and skills	Very fast overview of occupation of large areas, but difficult to determine chronology or functionality of sites as analysis is mainly based on morphological characteristics

Source: Made by M.C. Moreno Escobar.

been applied more homogeneously across the region and constitutes the method of choice across all research initiatives and projects, whereas the application of geophysics remains very limited. This is a trend shared across all research in classical archaeology, but it should be noted that non-invasive research approaches are becoming more widely applied in the Iberian Peninsula.[27]

Despite the heterogeneity of the archaeological site information considered in the present study, the re-evaluation of all the compiled archaeological evidence has generated a more nuanced dataset, where regional differences in the quality of the information have been reduced (Figure 6.5), thus limiting the impact of potential biases in the interpretation of the historical development of Tarraco's hinterland. Moreover, the relatively even distribution of sites across the study area could be considered representative of the settlement patterns developed in the Roman period, an assumption that was already postulated by previous research given the apparent lack of preference for the occupation of any specific type of topography, geology, or soils.[28] More importantly, this new and improved dataset makes possible the integrated study of the development of the local communities in the territory of Roman Tarraco and their potential transformations as they became increasingly involved in the new Imperial system brought about by Augustus. There remains, however, a doubt regarding the possible bias of the surveys carried

27 Teichner et al. (2020a); (2020b); in general for Europe, Campana (2022).
28 Carreté et al. (1995) 242–5.



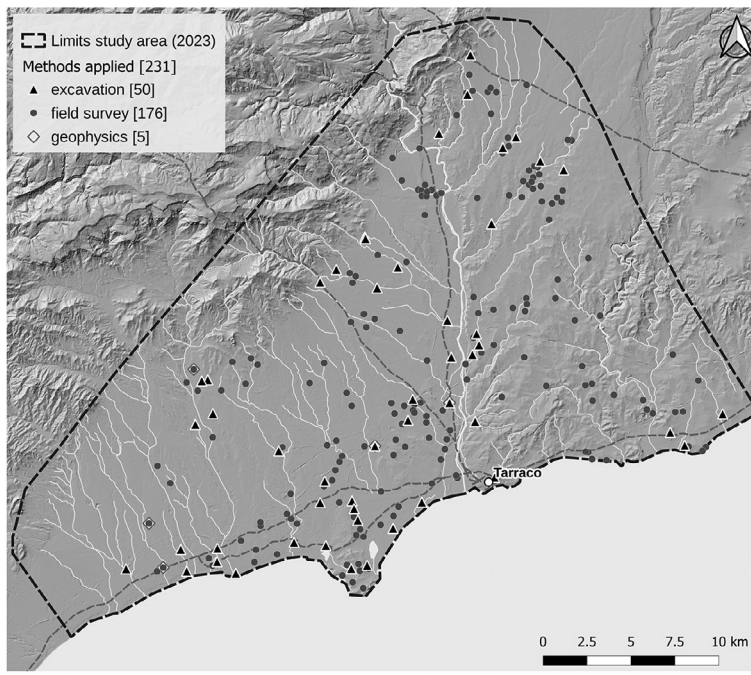


Figure 6.4 Above: Methods applied in the area across all phases and in each individual phase (absolute number of sites per phase and method in brackets). Below: Distribution of sites according to the methods applied for their study

Source: Made by M.C. Moreno Escobar.

out by both the Tarraco's hinterland and Ager Tarraconensis projects on the distribution of sites now integrated in this new dataset. In the Tarraco's hinterland project data, there seems to be a strong geographical correlation between the distribution of sites and the location of the surveyed areas. This observation can be reformulated as a hypothesis ('the development of surveys

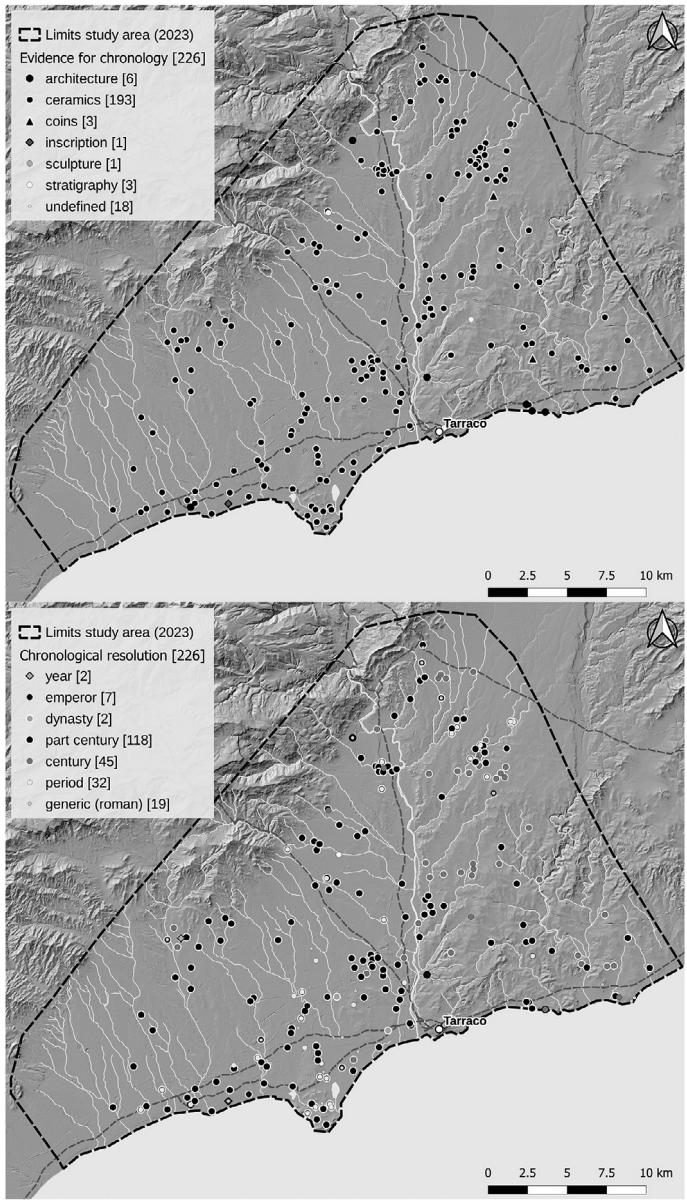


Figure 6.5 Above: Archaeological evidence used to define the chronology of each site (according to the evidence that provides a higher temporal resolution). Below: Estimated chronological resolution defined for each site
Source: Made by M.C. Moreno Escobar.

by the Tarraco's hinterland project identified a relatively higher number of sites in the surveyed areas than there were in the non-surveyed areas') that can be easily addressed using statistical methods, such as the chi-square.[29] Its application in this particular case does indeed demonstrate the impact of this project's survey activity in identifying sites within the general context of Tarraco's territory and reminds us of the potential for archaeological discovery that this area may still hold for future research.[30]

Unravelling Historical Development through Archaeological Analysis

The processes of data collection, re-evaluation, and processing described in the previous section resulted in the identification of 226 sites dated between the beginning of the first century BCE and the end of the first century CE. However, the full interpretative potential of this dataset for unravelling the potential impact of the Augustan Revolution in the local communities of Tarraco and its territory first appears after sites are grouped according to the time of occupation. There are 170 sites active in Phase 1 (i.e., first half of the first century BCE), 179 sites in Phase 2 (i.e., second half of the first century BCE to the end of the Augustan period in 14 CE), and 184 sites in Phase 3 (i.e., from 14 CE to the end of the first century CE). Despite its crudeness, this initial classification generates insights into the actual occupation of Tarraco's hinterland. While the growing number of sites is indicative of increasing occupation in the region, their relative comparison as percentages shows a certain trend of deceleration in the expansion of habitation across the region, given that there are 5.29% more sites from the late Republic (Phase 1) to the Augustan period (Phase 2) and only 3.35% more sites from the Augustan period (Phase 2) to the first century CE (Phase 3). Multiple interpretations can be used to explain these developments, so it is necessary to go to into further detail to generate a better understanding of the characteristics of these changes and the context in which they are developing. Characterising the occupation of Tarraco's hinterland in each phase will provide such detail, enabling the identification of elements of continuity and change across time that could contribute towards the understanding of these local communities.

An obvious approach to past landscape use is through the analysis and quantification of the functional types of sites that have been interpreted in the surroundings of Tarraco by applying the categorisation of sites described earlier (Table 6.1) and summarising it according to the sites' typology and chronology (Table 6.3).[31] However, once we begin addressing landscape uses, the need to analyse the geographical distribution of these uses becomes

29 See Shennan (1997) 104–9 for a detailed description of its implementation.

30 Confidence level: 0.05 (α = 95%); p-value: 3×10^{-18}. All other statistical tests in this contribution have been performed at this same confidence level.

31 This refers to the main functional typology of sites. It does not include other secondary functions, e.g., when a site is classified as a high-status settlement but also has a *figlina* amongst its identified structures, only the higher-level function (i.e., residential) is considered. Therefore, the exploration and analysis of all

Table 6.3 Number of sites classified according to their primary functional typology and phase of occupation

Site type	*Phase 1 (n = 170)*	*Phase 2 (n = 179)*	*Phase 3 (n = 184)*
town	1	1	1
vicus	1	1	1
high-status settlement	8	21	30
farm	52	55	63
undefined settlement	79	68	56
necropolis	1	2	2
mines and quarries	2	4	4
figlina	6	8	10
dumping ground	1	1	1
castrum	1	1	0
port	1	1	1
road infrastructure	0	1	1
water infrastructure	0	2	3
undefined site	17	13	11

Source: Made by M.C. Moreno Escobar.

particularly important, as they can potentially inform about changes in the modes and evolving patterns of occupation (e.g., displacement of occupation foci and higher-density areas across time).[32] Following this reasoning, the next paragraphs will discuss and analyse the archaeological evidence available for each phase to provide archaeological and geographical arguments that could potentially shed new light onto both the occupation of Tarraco's hinterland and the impact of the Augustan Revolution in the territory of this provincial capital.

Starting in the Late Republican period (Phase 1), the occupation of Tarraco's hinterland is represented by 170 sites, showing the highest concentration of sites in the north-east (east of the Francolí) followed by a high concentration of sites around Mas Serapi (ID 15576) immediately to the north-west of Tarraco (Figure 6.6, above). The configuration of the main roads articulates much of the territory of Tarraco and seems to influence also much of its occupation. This is particularly true in the area west of the Francolí river for the *Via Heraklea/Augusta* and, to a lesser extent, the *Via de Italia in Hispanias*. In contrast, the eastern side of Tarraco's territory seems to follow a different territorial logic potentially related to a lower development of

possible functions played by sites across the study area falls beyond the scope of this chapter and will be developed in a future publication.

32 Calculated through kernel density analysis, performed in ArcGIS Desktop 10.5 and considering the limits of the study area as processing extent.

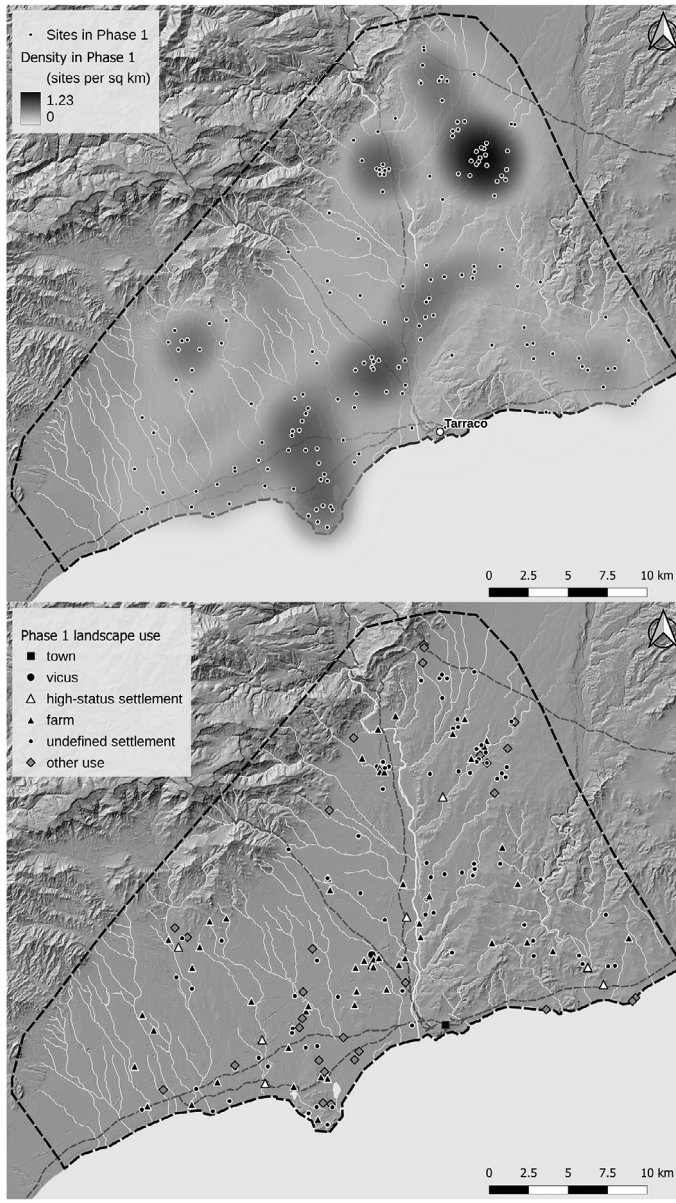


Figure 6.6 Above: Distribution and density of sites dated to Phase 1. Below: Landscape use in Phase 1
Source: Made by M.C. Moreno Escobar.

centuriationes and the impact they have on the reorganisation of spaces and territories, which could suggest a more substantial continuity with the territorial organisation inherited from the previous centuries.[33] It is also interesting to note the relatively simple hierarchisation of Tarraco's territory, where the town was situated at its core with a scattering of high-status settlements and denser distribution of farms, but a scarcity of other forms of occupation such as *vici*, with only one (Mas d'en Bosch, ID 15536) interpreted so far in this whole area.

In general terms, the landscape use deriving from this occupation can be roughly classified as 141 residential sites (83%) and 29 sites (17%) representing other uses (Figure 6.6, below). It is important to note the high number of both undefined settlements (79, 46%) and undefined sites (17, 10%) (Figure 6.7), which add some uncertainty to the interpretations we can extract from these data. However, much can still be said based on the remaining site categories and their percentages and distribution across the study area. Tarraco's territory is defined by some high-status settlements (8, 5%) whose geographic

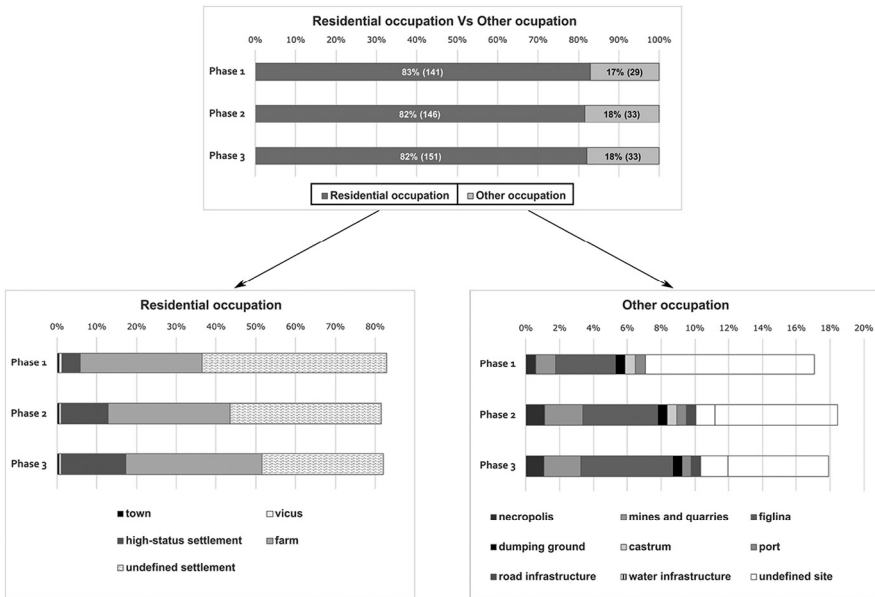


Figure 6.7 Above: Proportion of residential occupation compared to other occupation identified in Tarraco's territory. Below left: Percentage of residential occupation by site type. Below right: Percentage of non-residential occupation by site type

Source: Made by M.C. Moreno Escobar.

33 A hypothesis whose verification falls regrettably outside the scope of this contribution.

distribution does not follow a pattern of concentration.[34] Instead, they are relatively scattered throughout the landscape around Tarraco (mean distance: 11.1 km, maximum distance: 17.5 km, minimum distance: 6 km), whilst many of them are also in proximity to the main roads. In contrast with high-status settlements, farms are much more common across the area (52 sites, 31%), demonstrating the extensive agricultural exploitation of the rural landscape (Figure 6.6, below), a role supported not only by the characteristics of their material evidence, but also by their proximity to waterways. Interestingly, these sites do present a statistically significant pattern of concentration which appears unrelated to the extent of the areas surveyed by the Tarraco's hinterland and Ager Tarraconensis projects, thus highlighting how the agricultural production in this area may be showing a certain pattern of intensification.[35] The identification of the *vicus* at Mas d'en Bosch, located near one of the main roads in the study area and within a concentration of farms, might also point to the farms' potential dependence on this *vicus* based on their close spatial relations. However, the role played by this *vicus* on a wider scale remains unclear given its relative proximity to the town (only 7 km away) within a much larger area.

Looking at the other types of non-residential occupation, we can observe a relative specialisation of some areas within the territory of Tarraco particularly focused on the production of ceramics (as exemplified in the six *figlinae* active in this phase, e.g., Forn de Fontescaldes, ID 15644, and Camí del Roquís, ID 15595) and of stone for building material (e.g., Punta de la Llança, ID 15805). The spatial distribution of these *figlinae* presents different behaviours, with some located near roads (e.g., Forn de Fontescaldes) and others much farther away from the main communication axes (e.g., Mas de Gomandí, ID 15697).[36] In contrast, both stone quarries potentially active in this phase are found in similar coastal contexts, thus supporting the probability of maritime transport for their produced building materials, a theory already proposed in previous research.[37]

34 Nearest Neighbour ratio: 1.2163, z-score: 1.1705, p-value: 0.2418. The patterns of concentration discussed in the text were explored through the application of the Nearest Neighbour Analysis, a statistical test relating the observed distance between points and their closest neighbour with an expected distance if that distribution was random. Despite its limitations (e.g., Conolly and Lake (2006) 164–6), it remains a useful first step to approaching spatial patterning in archaeological studies. These analyses were carried out using the GIS software ESRI ArcGIS Desktop 10.5 and considering the limits and characteristics of the study area.

35 Nearest Neighbour ratio: 0.7760, z-score: −3.0899, p-value: 0.0020.

36 Due to the limits imposed in this contribution, it is not possible to explore in detail the identification, characterisation, and temporal development of both the *figlinae* identified in Tarraco's territory (an earlier study being Járrega Domínguez and Prevosti Monclús (2011)). However, the application of the hypotheses and approaches developed by V. Moreno Megías (Chapter 12 in this volume) to their ceramic production can potentially provide new evidence about the role of foreigners (particularly Romans and Italians) in the observed transformation of these industries.

37 Terrado Ortuño (2020) 91.

In the Augustan period (Phase 2), there are 179 active sites across Tarraco's territory and their pattern of concentration shows certain similarities with the previous phase, such as the highest occupation density still being found in the north-east and the apparent importance of the communication axes to the location of sites in much of the region (Figure 6.8, above). Nonetheless some differences are apparent, particularly the increase in occupation density to the north-west of Tarraco around Mas de Serapi and the comparatively higher attraction that the *Via Heraklea/Augusta* seems to exert on the foundation of new sites (e.g., Torre dels Escipions, ID 15601). However, in some cases the proximity to the coast might have been a leading factor in the location of new sites (e.g., El Cap de Sant Pere, ID 15493). In general terms, the relatively simple hierarchisation of Tarraco's territory remains much the same, with only one *vicus* still active in the whole region (Mas d'en Bosch) and multiple high-status settlements and farms distributed across the landscape. An additional element of continuity is also present in the similar proportion between residential (146 sites, 82%) and non-residential (33 sites, 18%) sites in the landscape compared to the previous phase (Figure 6.7). There are, however, certain elements of change. Firstly, there is a decrease in the number of both undefined settlements (68, 38%) and undefined sites (13, 7%) (Figure 6.7), which, when considered within the context of increasing occupation in the region, results in a reduction of the uncertainty surrounding the interpretation of these changes, given how more of the landscape use is known in comparative terms.

With respect to the high-status settlements, we can observe a substantial increase in both their absolute number (21 sites) and their relative proportion (12%), accompanied by a geographic distribution that (again) does not follow a pattern of concentration.[38] Their spatial distribution shows some interesting traits nonetheless; whilst they appear relatively scattered across the landscape in relation to Tarraco (mean distance: 11.6 km, maximum distance: 22 km, minimum distance: 3.3 km), there seems to be a stronger relation with the main communication axes in the area (e.g., Barranc de la Donzella, ID 15487), most particularly with the *Via Heraklea/Augusta*, and around the plain west of the Francolí river (e.g., Mas de la Boella, ID 15572). There are six instances where previous rural settlements acquired elements of luxury (e.g., Els Antigons, ID 15695), thus showing the continuation of the process of monumentalisation of the rural occupation of Tarraco's countryside identified in the earlier phase, but which could also be taken both as evidence of the economic success of the town's local elites and, on a more symbolic level, as their way of showing their *Romanitas* and adherence to the Roman ways of *otium*. However, it is fundamental to note that this monumentalisation goes hand in hand with the continuation, and in some cases expansion, of the economic and productive roles of these rural settlements, with some of them developing facilities aimed at the commercialisation and export of their agricultural production (e.g., La Canaleta, ID 15501).

38 Nearest Neighbour ratio: 0.8162, z-score: −1.6115, p-value: 0.1071.

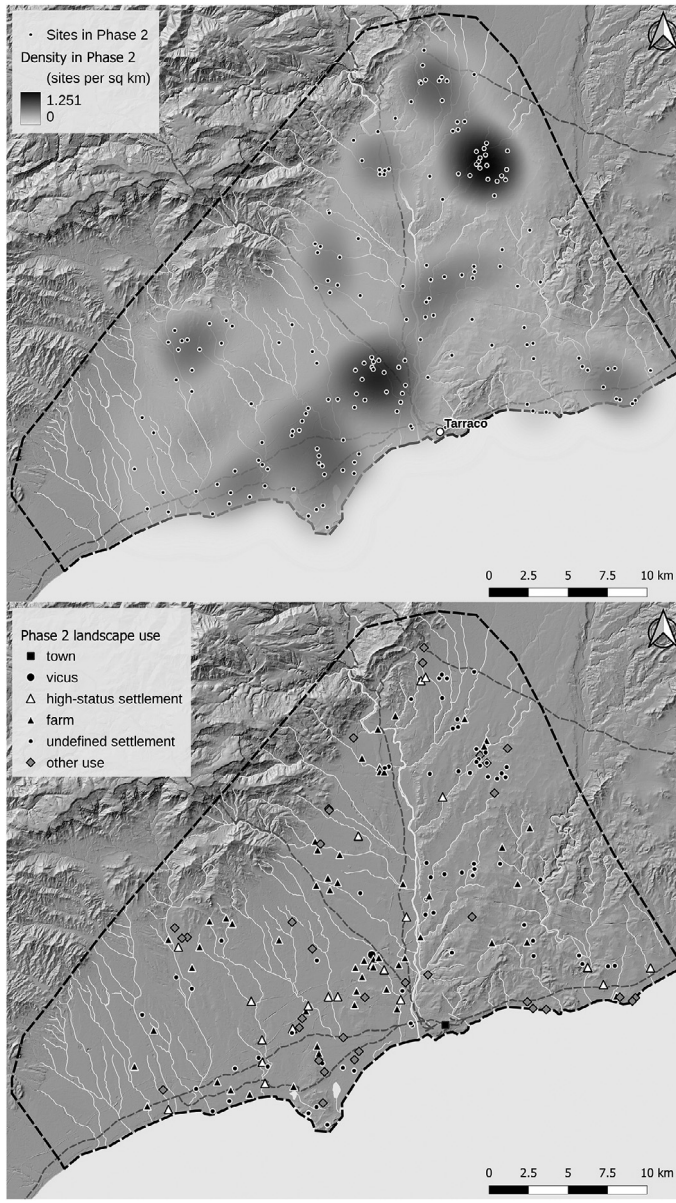


Figure 6.8 Above: Distribution and density of sites dated to Phase 2. Below: Landscape use in Phase 2
Source: Made by M.C. Moreno Escobar.

Shifting our attention towards farms, we can observe that, whilst their absolute number increases slightly (55 sites), their relative importance in this Augustan context remains the same as in the Late Republican period (31%). Similarly, farms are still the most numerous identifiable site type across the area, thus continuing to attest to their role in the extensive agricultural exploitation of Tarraco's rural landscape (Figure 6.8, below). Again, farms show a pattern of concentration seemingly unrelated to the distribution of the areas more intensively surveyed by previous research.[39] Their position relative to elements in the landscape, however, seems to change. Many of them are still in proximity to waterways, but some appear to prioritise proximity to roads now as well, which could be interpreted as evidence of the increase in competition amongst the occupants of Tarraco's territory to facilitate the export of their agricultural production to the local markets.

Looking at other types of non-residential occupation in the Augustan period, there is a higher number of *figlinae* (8 sites) and mines and quarries (4 sites), some of them newly founded, such as the kiln at El Brugar (ID 15524) and the stone quarry at Punta de la Creueta (ID 15807). Their percentages in relation to the general occupation of Tarraco's territory remain fairly similar to the previous phase (4% and 2%, respectively), which is interpreted as indicative of the continued and expanding interest in the production of amphorae (e.g., Dressel 2–4 Catalan for wine export) as well as both ceramic and stone building materials. It is worth noting that most of these *figlinae* are located relatively far from the coast, in clear contrast with the stone quarries, all of which are found within the eastern *Tarraconensis* in a mountainous area much closer to the sea, thus offering better and more efficient opportunities for the transport of stone materials. There are also new non-residential developments in the area, including infrastructure related to the construction of the aqueducts (e.g., Pont del Diable, ID 15593, and Aqueduct of Gaià, ID 15639), the identification of a possible *mansio* in Mas d'en Bertran (ID 15535), as well as the construction of the funerary monument at Torre dels Escipions (ID 15601).[40]

Finally, the occupation of Tarraco's territory for the remainder of the first century CE after the Augustan period (Phase 3) is represented by a total of 184 sites, pointing generically at an expansion in the habitation of the area that shows its highest concentration in the area north-west of Tarraco around Mas Serapi (ID 15576) (Figure 6.9, above), with several other areas of high concentration distributed around the town's territory. The territorial trends observed in the previous phases of the sites (namely the concentration around both roads, particularly the *Via Heraklea/Augusta*) and waterways still remain

39 Nearest Neighbour ratio: 0.7775, z-score: −3.1285, p-value: 0.0018.

40 C. Botturi (Chapter 3 in this volume) provides an in-depth discussion of the transformation in funerary practices on a landscape scale that successfully illustrates the impact of Rome on the ways local communities interacted and displayed their relationship with their deceased.

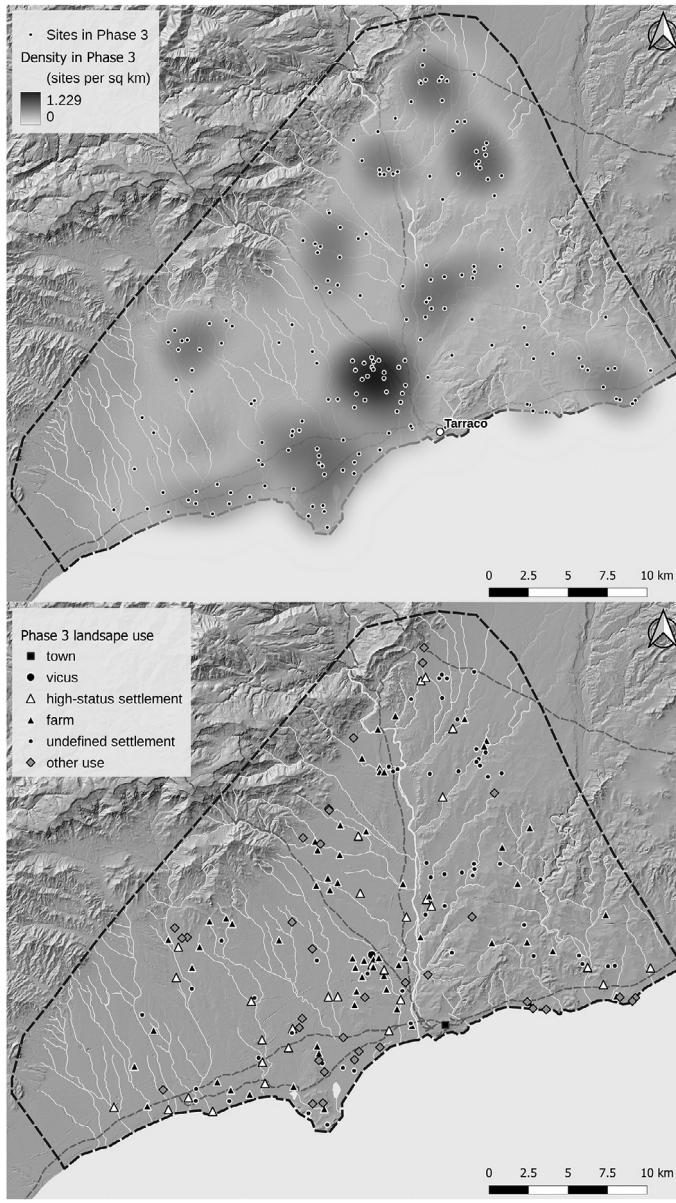


Figure 6.9 Above: Distribution and density of sites dated to Phase 3. Below: Landscape use in Phase 3
Source: Made by M.C. Moreno Escobar.

whilst proximity to the coastal area has also become a stronger factor in the occupation of Tarraco's territorial landscape. The hierarchisation of the region also remains quite similar to the previous phases in its structure (i.e., town > *vicus* > high-status settlement > farm) and with the continuation of occupation at the *vicus* of Mas d'en Bosch, but also shows changes in the number of high-status settlements and farms. Looking at how these landscapes are used, there is a strong continuation with the Augustan period (Figure 6.7, above), with relative proportions of residential occupation and other types of occupation remaining the same (82% and 18%, respectively) despite the changes in the absolute numbers of sites identified and classified in each category (151 sites and 33 sites, respectively). The absolute number and relative percentages of undefined settlements also decrease (56 sites, 30%), which again marginally increases the interpretative value of the settlement pattern dataset for the first century CE.

With respect to the different residential types of occupation, the first century CE is witness to a further increase in the number and relative proportion of high-status settlements across Tarraco's territory (30 sites, 16%), with a geographical distribution showing a pattern of concentration.[41] Their relative position around Tarraco remains fairly similar to the Augustan period (mean distance: 12.3 km, maximum distance: 22 km, minimum distance: 3.2 km). These high-status settlements are also consistent in their close connection with the *Via Heraklea/Augusta* identified in the previous phase, potentially also prioritising proximity to the coast as an additional locational factor in the first century CE. In this sense, it is relevant to note that the transition of the site at L'Esquirol (ID 15504), located on the littoral approximately 16 km to the west of Tarraco, from undefined settlement to high-status settlement is not an isolated case. There are four other instances of this same transition. The Villa del Mas dels Canonges (ID 15517) offers an interesting case where the remains of several rooms belonging to a bathhouse were found and excavated but were not found to be associated with any close high-status settlement. The excavators proposed instead that the residential sector to which this bathhouse belonged could be located under the modern agricultural building. This site would thus reinforce the identification of the general trend towards the monumentalisation and "Romanisation" of Tarraco's countryside.

Farms continue to be the most common site type across the area (63 sites, 34%) in Phase 3, thus continuing to support the extensive exploitation of the agricultural resources in Tarraco's territory (Figure 6.9, below). Their locations still seem to be generally linked to the distribution of waterways, whilst they also present a pattern of concentration unrelated to the extent of the areas surveyed by previous research projects.[42] Considering all the evidence related to high-status settlements and farms, we can observe the further development of the pattern towards the intensification of the agricultural production in this

41 Nearest Neighbour ratio: 0.7017, z-score: −3.1260, p-value: 0.0018.
42 Nearest Neighbour ratio: 0.8268, z-score: −2.6088, p-value: 0.0091.

area, already identified in the previous phases of occupation. This process, however, reveals different trends when looking specifically at high-status settlements, of which there is a significant increase in relative terms between the late Republican (Phase 1) and Augustan (Phase 2) periods quantified at 163% or 13 more high-status settlements. This trend decreases markedly in the first century CE to just a 43% increase or 9 additional high-status settlements. In contrast, farms witness a much smaller increase in their occurrence throughout this timeline, with an increase of only 6% (3 new sites) between Phase 1 and Phase 2 and a 15% increase (8 new sites) from Phase 2 to Phase 3.

Turning to non-residential sites, the trend towards the specialisation of landscape use in certain areas continues and, in some instances, expands. The activity of *figlinae* continues to expand (5%, 10 sites), with two new sites initiating their ceramic production (i.e., Àrea d'Expectativa Arqueologica 573, ID 15519, and Barranc de Sales, ID 15673) and the general continuation of the sites already active in the Augustan period. The first of these new sites, Àrea d'Expectativa Arqueologica 573, was founded near the coast and apparently specialised in the production of amphorae, potentially indicating an increased importance for exports in the economic context of Tarraco in the first century CE, which would align with the apparent continued agricultural production in the town's territory. Apart from this *figlina*, the general distribution of the *figlinae* remains quite similar to what was observed in the Augustan period. The production of stone also remains stable with all the quarries active in Phase 2 continuing their activity into Phase 3. This is likely related to the general process of architectural monumentalisation of both the city, such as the extensive building activity in Tarraco with the construction of the new public spaces in the area formerly occupied by the legionary *castrum*, and the countryside, where many rural settlements continued their architectural development into high-status settlements. The coastal location of these quarries continues to highlight the potential for maritime transport of the extracted materials from their sources to their potential destinations in Tarraco and beyond.

Although falling outside the scope of this chapter, a few words can be said about the transformation of Tarraco's territory from a militarised area in the Iberian period to a more civilian, and Roman, territory. Previous research has identified a general trend developing in the second century BCE that refers to the progressive abandonment of the main Iberian *oppida* in the area, none of which were still occupied at the beginning of the first century BCE.[43] The Castellum of Puigpelat (ID 15696) offers an interesting glimpse into this process. Its excavations between 2006 and 2007 led to the identification of a Roman military camp which was built at the beginning of the Roman occupation, reconstructed around the time of the Sertorian War, and was finally abandoned and dismantled in the Augustan period.[44] In comparison with the

43 López Vilar et al. (2011) 383.
44 Díaz García (2009); Díaz García and Ramírez Roldán (2015).

aforementioned trend, this site demonstrates instead the close relationship of local communities and military forces with political developments in Rome, such as the civil wars in the first century BCE and the final pacification of the provinces under Augustus. In this sense, we can interpret different dynamics under development in the same rural contexts of Tarraco—on one hand, the progressive transformation from its Iberian roots towards more Roman ways of territorial organisation and occupation; and on the other hand, the progressive incorporation of those local communities into the political, economic, social, and representational circuits of the Roman Empire.

Conclusions: Landscape Transitions in Tarraco

This contribution began with a brief presentation of the historical and archaeological development of Tarraco and the discussion of the projects and initiatives that, developed in recent decades, have shaped both the questions explored and the methods applied by researchers on the territories and landscapes around this Roman town. It then discussed the generation and characteristics of the dataset employed as the foundation for exploring the transformations of the local communities settled in this area between the beginning of the first century BCE and the end of the first century CE. This information was collected, expanded, and reassessed within a unified temporal and typological framework. This process aided in integrating the areas so far only loosely connected in previous research and added nuance and resolution to the existing archaeological data for Tarraco's territory. Building upon these data, it was possible to quantify and characterise this information both temporally and functionally, the analysis of which has successfully identified several trends of occupation in the territory of Roman Tarraco. At a general level, there was a decrease in occupation expansion across the territory from the Late Republic to the first century CE, as fewer sites are newly occupied between Phase 1 and Phase 3. In contrast, on a more detailed scale, there was an intensification of the residential use of these landscapes, with both farms increasing steadily through time and high-status settlements developing not only more monumentalised residential areas but also new agricultural infrastructure. The increased occupation of the countryside, through either more utilitarian farms or more monumental and complex rural residential settlements, is a trend that has also been observed in other areas across Hispania and extensively discussed, both in this volume and elsewhere.[45] This increase would also imply a potential increase in production, both agricultural and non-agricultural, evidenced for example by the multiple fragments of mills, *torcularia*, and *figlinae* found across these rural contexts, as well as in the opening of new stone quarries. The highest absolute and

45 In this volume by F. Hermann and colleagues (Chapter 8) and A. Quevedo and colleagues (Chapter 9); some recent analyses of this trend can be found in Hidalgo Prieto (2016) and Noguera Celdrán and Antolinos Marín (2019).

relative increase in high-status settlements occurs in the Augustan period, a trend that could be linked to the designation of Tarraco as the provincial capital, but also to Augustus' visit to Tarraco. This could be viewed as potential evidence of Augustus' long-lasting effect on the local aristocracy and the ways they represented their loyalty to the emperor and the new Imperial regime. Regardless of this last possibility, the increasing monumentalisation of rural settlements is indicative of the economic success of these local communities in generating and trading the agricultural production in these rural contexts. These communities and individuals then invested and displayed their newly acquired wealth in Roman ways. In this sense, the Augustan Revolution was deeply felt in Tarraco and its territory not only through the presence of the emperor himself in the city, but also in the deepening links between these local communities and the Roman Empire; in their further integration into the Imperial economic, political, and social systems; and in the ways these local communities decided to represent themselves to their own community and to strangers who travelled to their part of the Empire.

This chapter has developed a diachronic analysis of the material evidence for the occupation of Tarraco's territory. This approach has successfully demonstrated, firstly, the close ties between the local communities and the first Roman emperor and the revolution he began, and secondly, how exploring the evolving relationship between these communities and the landscapes they inhabited can deepen our understanding of how these provincial communities became fully integrated and entangled within the Roman Empire. Future research avenues include exploring the structure of this occupation and how it changed over time through spatial analysis, particularly in relation to the roles of roads and rivers, and the apparent increasing attraction of the littoral during early Imperial times. These topics will be studied in a future research contribution.

References

Abascal Palazón, J.M. (2006), 'Los tres viajes de Augusto a Hispania y su relación con la promoción jurídica de ciudades', *Iberia: Revista de la Antigüedad* 9, 63–78.

Campana, S. (2022), 'Some Thoughts on Current Trends in Archaeology of Once-Townscapes Compared with Rural Landscapes in the Mediterranean World', in D. Filippi (ed), *Rethinking the Roman City. The Spatial Turn and the Archaeology of Roman Italy*. 32–50. London, New York.

Carreté, J.-M., S.J. Keay, and M. Millett (1995), *A Roman Provincial Capital and its Hinterland: The Survey of the Territory of Tarragona*. Ann Arbor (MI).

Ciurana Prast, J. (2008), 'El poblament romà a l'oest de l'Alt Camp', in J.M. Vergès Bosch and J. López Vilar (eds), *Prehistòria i Història Antiga*. 400–412. Valls.

Conolly, J. and M. Lake (2006), *Geographical Information Systems in Archaeology*. Cambridge.

Díaz García, M. (2009), *El Castellum de Puigpelat*. Tarragona.

Díaz García, M. and R. Ramírez Roldán (2015), 'El asentamiento militar de Puigpelat (Alt Camp, ager tarraconensis), un castellum tardorrepublicano en tierras tarraconenses', *Revista d'arqueologia de Ponent* 25, 263–278.

Generalitat de Catalunya (2017), EGIPCI: eGestió Integral del Patrimoni Cultural Immoble [Online]. Available from: https://egipci.cultura.gencat.cat/login.aspx (accessed 12. 8. 2022).

Hidalgo Prieto, R. (ed) (2016), *Las villas romanas de la Bética*. Sevilla.

Járrega Domínguez, R. and M. Prevosti Monclús (2011), 'Figlinae tarraconenses. La producció ceràmica a l'ager Tarraconensis', in M. Prevosti Monclús and J. Guitart i Duran (eds), *Ager Tarraconensis(Volumen*2): *El poblament = The population*. 455–489. Tarragona: Institut d'Estudis Catalans–Institut Català d'Arqueologia Clàssica.

Keay, S.J. and M. Millett (2003), Ager Tarraconensis Field Survey Project [dataset] [Online]. doi:10.5284/1000351.

Lasheras González, A. (2018), *El suburbi portuari de Tarraco a l'Antiguitat Tardana (segles III-VIII d.C.)*. PhD thesis, Universitat Rovira i Virgili. Tarragona.

Lasheras González, A. and P. Terrado Ortuño (2018), 'New Approaches to the Study of the Harbour of Tarraco: Archaeological and Literary Research (3rd Century BC – 8th Century AD)', in C. von Carnap-Bornheim, F. Daim, P. Ettel, and U. Warnke (eds), *International Conference. Harbours as Object of Interdisciplinary Research – Archaeology + History + Geosciences*. 165–181. Mainz.

López Vilar, J., M. Prevosti Monclús, and I. Fiz Fernández (2011), 'Estudi del poblament per períodes cronològics i per tipologies / A Study of the Population by Chronological Periods and Typologies', in M. Prevosti Monclús and J. Guitart i Duran (eds), *Ager Tarraconensis 2: El Poblament = The Population*. 372–404. Tarragona.

Mar, R., J. Ruiz de Arbulo, D. Vivó, and J.A. Beltrán-Caballero (2012), *Tarraco. Arquitectura y urbanismo de una capital provincial romana*. Volumen 1: *De la Tarragona ibérica a la construcción del templo de Augusto*. Tarragona.

Moreno Escobar, M.C. (2020), 'Linking Seascapes and Landscapes: The Case of Tarraco (Tarragona, Spain) during the Roman Empire', in A. Cristilli, A. Gonfloni, and F. Stok (eds), *Experiencing the Landscape in Antiquity. I Convegno Internazionale di Anticchità – Università Degli Studi di Roma 'Tor Vergata'*. 209–216. Oxford.

Noguera Celdrán, J.M. and J.A. Antolinos Marín (2019), *Villae: vida y producción rural en el sureste de Hispania: [exposición] Museo Arqueológico de Murcia, 8 de marzo / 3 de junio*. Murcia.

Palet Martínez, J.M. (2003), 'Estructuras agrarias en el territorio de Tarraco (Tarragona): organizacion y dinámica del paisaje en época romana', in A. Bouet and F. Verdin (eds), *Territoires et Paysages de l'Age du Fer au Moyen Âge: Melanges Offerts à Ph. Leveau*. 213–226. Bordeaux.

Palet Martínez, J.M. (2008), 'Formes del paisatge i trames centuriades al Camp de Tarragona: aproximació a l'estructuració del territori de Tarraco', in J.A. Remolà (ed), *El Territori de Tarraco: Vil·les Romanes del Camp de Tarragona*. 49–64. Tarragona.

Palet Martínez, J.M., I. Fiz Fernández, and H.A. Orengo Romeu (2010a), 'Modelación y conceptualización del paisaje romano en el ager tarraconensis: Tarraco y la centurización del territorio', in C. Corsi and F. Vermeulen (eds), *Changing Landscapes: The Impact of Roman Towns in the Western Mediterranean. Proceedings of the International Colloquium, Castelo de Vide - Marvão 15th-17th May 2008*. 167–184. Bologna.

Palet Martínez, J.M. and H.A. Orengo Romeu (2010), 'Les centuriacions de l'ager Tarraconensis: organització i concepcions de l'espai / The Centuriations of the Ager Tarraconensis: Spatial Organisation and Conceptualisation', in M. Prevosti Monclús and J. Guitart i Duran (eds), *Ager Tarraconensis* v. 1: *Aspectes històrics i marc natural / Historical Aspects and Natural Setting*. 121–154. Tarragona.

Palet Martínez, J.M., H.A. Orengo Romeu, and S. Riera Mora (2010b), 'Centuriación del territorio y modelación del paisaje en los llanos litorales de Barcino (Barcelona) y Tarraco (Tarragona): Una investigación interdisciplinar a través de la integración de datos arqueomorfológicos y paleoambientales', *Agri Centuriati: An International Journal of Landscape Archaeology* 7, 113–132.

Pérez Martín, W. (2007), *Troballes arqueològiques al litoral tarragoní. Dotze anys d'arqueologia subaquàtica (1968–1980)*. Tarragona.

Prevosti Monclús, M. (2010), 'La ciutat de Tarraco, entre nucli urbà i territori / The City of Tarraco, between an Urban Centre and a Territory', in M. Prevosti Monclús and J. Guitart i Duran (eds), *Ager Tarraconensis* v. 1: *Aspectes històrics i marc natural = Historical Aspects and Natural Setting*. 25–112. Barcelona, Tarragona.

Prevosti Monclús, M. and J. Guitart i Duran (2010a), *Ager Tarraconensis* v. 1: *Aspectes històrics i marc natural = Historical Aspects and Natural Setting*. Barcelona, Tarragona.

Prevosti Monclús, M. and J. Guitart i Duran (2010b), *Ager Tarraconensis* v. 3: *Inscripcions romanes, Les (IRAT) = The Roman Inscriptions.* Barcelona, Tarragona.

Prevosti Monclús, M. and J. Guitart i Duran (2011), *Ager Tarraconensis* v. 2: *El poblament = The Population*. Tarragona.

Prevosti Monclús, M., J. Guitart i Duran, and J. López Vilar (2013), *Ager Tarraconensis* v. 5: *Paisatge, poblament, cultura material i història: Actas del simposi internacional = Landscape, Settlement, Material Culture and History: Proceedings of the International Symposium*. Barcelona, Tarragona.

Roca Roumens, M. and M.I. Fernández García (eds) (2005), *Introducción al estudio de la cerámica romana: una breve guía de referencia*. Málaga.

Rodà, I. (2016), 'Tarraco y Barcino en el Alto Imperio', *Revista de Historiografía* 25, 245–272.

Salomon, F., S.J. Keay, J.M. Macías Solé, and I. Teixell Navarro (2015a), *Geoarchaeology of the Roman Harbour of Tarragona, Core TA-1*. University of Southampton. Southampton.

Salomon, F., S.J. Keay, J.M. Macías Solé, and I. Teixell Navarro (2015b), *Geoarchaeology of the Roman Harbour of Tarragona, Core TA-2*. University of Southampton. Southampton.

Sentís Carazo, C. (2008), 'La vil·la del Torrent de les Voltes de Puigpelat', in J.M. Vergès Bosch and J. López Vilar (eds), *Prehistòria i Història Antiga*. 377–379. Valls.

Shennan, S. (1997), *Quantifying Archaeology*. Iowa City.

Strutt, K.D. (2018), *Report on the Geophysical Survey at Tarragona, Catalonia, Spain, October-November 2015*. Southampton.

Tacitus, P.C. (2017), *The Annals, From Tiberius to Nero*, trans. A.S. Kline [Online]. https://topostext.org/work/200 (accessed 15. 9. 2023).

Teichner, F., E. Illarregui Gómez, F. Hermann, M.C. Moreno Escobar, and P. Arribas Lobo (2020a), '"Ver lo invisible": prospecciones geofísicas en el yacimiento arqueológico de Tiermes (Montejo de Termes, Soria)', in C. Pérez González, P. Arribas Lobo, and O.V. Reyes Hernando (eds), *Estudios y Recuerdos in Memoriam Prof. Emilio Illarregui Gómez*. 105–123. Soria.

Teichner, F., C. Salzmann, and M.C. Moreno Escobar (2020b), 'La villa romana de La Olmeda 50 años después: más allá de las excavaciones arqueológicas clásicas', in R. Martínez, T. Nogales, and I. Rodá (eds), *Actas Del Congreso Internacional 'Las Villas Romanas Bajo-Imperiales de Hispania'*. 89–115. Palencia.

Terrado Ortuño, P. (2018), *Portus Tarraconis. El puerto de Tarraco en época romana tardorrepublicana y altoimperial. Fuentes, historiografía y arqueología*. PhD thesis, Universitat Rovira i Virgili. Tarragona.

Terrado Ortuño, P. (2019), *El puerto de Tarraco en época romana (siglos II a.C.-III d.C.). Fuentes, historiografía y arqueología*. Tarragona.

Terrado Ortuño, P. (2020), *Els ports antics de Tarraco. Embarcadors, ports i platges del litoral tarraconense en època romana (S. II a.C. - III d.C.)*. Tarragona.

University of Southampton (2014), Roman Amphorae: A Digital Resource [Online]. doi:10.5284/1028192 (accessed 4. 8. 2022).

Vila Fàbregas, G. (2008), 'La vil·la de la Bòbila d'en Piteu', in J.M. Vergès Bosch and J. López Vilar (eds), *Valls e La Seva Historia: Prehistòria i Història Antiga*. 385–388. Valls.