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Re-thinking Chalcolithic landscapes in southeast Iberia: the case of the Middle Antas river (Almeria, Spain)

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Re-thinking Chalcolithic landscapes in southeast Iberia: the case of the Middle Antas river (Almeria, Spain)

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Abstract

Our understanding of Chalcolithic settlements in southern Iberia (c. 3200–2200 BCE) has changed dramatically in recent decades. Instead of clearly bounded and dense settlements, archaeology is establishing a range of site types, some sparsely settled, some quite large. Such varied settlement typology is now understood as being part of a thriving period of development, which included monumental tombs, high-quality craft organisation and highly dynamic exchange networks. This article presents recent work around the River Antas in Almeria, Spain, which has revealed a complex settlement network along the river for the period in question. This new evidence challenges our understanding of prehistoric habitation in the area and poses new questions about major settlement pattern changes in the prehistory of the region.

Keywords: Chalcolithic, Iberia, prehistory, settlement, archaeological survey

Introduction

The Chalcolithic period in Iberia is commonly dated to c. 3200–2200 BCE, and it was traditionally thought to be a relatively quiet period marked in its later part by the arrival of the Bell Beaker phenomenon around 2750 BCE (Cardoso 2014). The period is normally seen as foundational for the significant developments of the Bronze Age El Argar culture typical of southeast Iberia (2200–1500 BCE) (Jiménez-Jáimez and Suárez-Padilla 2020; Lillios 2020; Díaz-del-Río 2023).

In recent decades, new excavations and finds have inspired a rethinking of the Chalcolithic period, and southern Iberia is now understood as one of the most dynamic regions of the later fourth millennium to the earlier third millennium BCE Mediterranean (Broodbank 2013; Murillo-Barroso et al. 2015; Schuhmacher 2017; Díaz-del-Río 2023). This shift started with the realisation that Chalcolithic sites were difficult to recognise archaeologically as they defied expectations (Díaz-del-Río 2004b). Such sites are normally composed of negative features, such as pits in low-density scatters, leaving an archaeological imprint that is sometimes difficult to recognise (Márquez Romero and Jiménez Jáimez 2010; Jiménez-Jáimez and Suárez-Padilla 2020). Certain sites are more than 300 ha in extent, and the best-known examples appear to be delimited by features such as ditches (Díaz-del-Río 2004a; Márquez Romero and Mata-Viva 2017). On occasion, tombs are associated with settlements – some monumental such as the Montelirio tomb in Valencina de la Concepcion (see Figure 1 for mentioned sites; García Sanjuán et al. 2016). At the other end of the spectrum, small settlements such as Puente de Santa Barbara (1.5 ha) are also known (González Quintero et al. 2018), and it is possible that many of these smaller sites are unnoticed as they may have a similarly low density of habitation as the larger ones. There is also a temporal pattern, as the later Chalcolithic period sites (c. 2750 BCE onwards) seem to become smaller and more densely occupied, some of them protected by defensive walls (Jorge 2003; Lull et al. 2018). There may be exceptions to this trend, such as the famous Los Millares site where the construction of the various walls is dated to its earliest occupation (Molina González et al. 2020). This latter example showcases the challenging questions about temporality that archaeologists encounter regarding Chalcolithic sites:

whether the numerous features and extensive areas were used contemporaneously, seasonally or consecutively (García Sanjuán et al. 2018).

The low density of these sites does not preclude the presence of markers of social complexity. Inhabitants were able to procure materials, some rare, from far away (Rodríguez et al. 2020; Jordão and Pimentel 2022; Murillo-Barroso 2022; Murillo-Barroso et al. 2018), as evidenced by the crystal dagger and ivory sheath, the amber beads or the gold sheets found in the tomb of Montelirio (Murillo-Barroso et al. 2015; Morgado et al. 2016). Isotopic analyses also demonstrate significant human (Valera et al. 2020; Cintas-Peña and García Sanjuán 2022; Díaz-del-Río et al. 2022) and cattle (Žalaitė et al. 2018) movement from beyond the immediate hinterland. The internal structure of most settlements is unclear, but it has been suggested that certain areas of the sites may be identified as specialised workshops (Nocete et al. 2013; González Quintero et al. 2018), a suggestion underlined by the high-quality items found there. Social differentiation may also be represented by the presence of richly furnished tombs at certain sites such as Los Millares (Afonso Marrero et al. 2011). These factors appear to indicate a degree of settlement-wide organisation, a notion supported by the organisational capacity to gather the workforce necessary to produce large ditches, defensive walls and monumental tombs.

The combination of large, low-density, loosely organised settlements with features that indicate social complexity is challenging to characterise, as archaeologists lack the social models that fit with the material record. Only recently has it become clear that such settlements are more common than anticipated in human history and in many cases are accompanied by complex social and economic traits (White and Fletcher 2023). In the case of Iberia, our focus on applying these theoretical developments to the larger and better-known sites has left a gap in our understanding of smaller sites and the varied settlement systems of the period.

The project VERASUR was initiated in 2018 to acquire new, more detailed evidence about settlement patterns in the region of Vera, southeastern Iberia. This is an area of particular interest as different human mobility events define the history of the region: the early arrival of the Neolithic; the Bell Beaker phenomenon; the influx of new Bronze Age populations; Phoenician and Punic expansions; and the Roman

and Islamic conquests. The project aims to explore the long-term relationship between settlement strategies (location, defensibility, number, size) and cycles of interaction in the region, investigating those patterns and processes that are repeatedly observed across periods and those that are exceptional. The project is also intended as a methodological case study in which intensive survey methodologies developed elsewhere in the Mediterranean are applied to prehistoric Iberia, where deployment of such techniques is more limited, resulting in a paucity of systematic and intensive survey data.

The prehistoric importance of the River Antas

The stretch of the River Antas studied in our project (Figures 1 and 2) has been relatively protected from the modern intensive agricultural transformations typical of the region due to the presence of

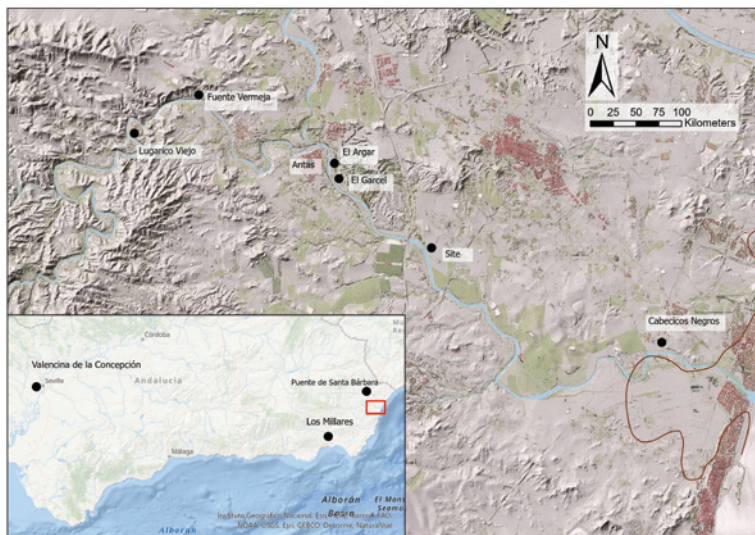


Figure 1 Map of southern Spain with mentioned sites and LiDAR image of the Middle and Lower Antas River with mentioned sites. Red line indicates probable prehistoric coastline.



Figure 2 Aerial image of the River Antas area near El Argar with surveyed areas with designations. White squares: 100 m² sectors; yellow squares: 400 m² sectors; black dots: *puntos de interés* (points of interest)

archaeological sites excavated in the nineteenth century CE (Siret and Siret 1890). It provides a rare window into the prehistoric human landscapes of Mediterranean Iberia. The best-known sites are two Bronze Age settlements: Lugarico Viejo and El Argar (Figures 1 and 2). Both excavated in the nineteenth century CE (Siret and Siret 1890), the latter is famous as it gives its name to the El Argar culture, one of the

classic Bronze Age cultures of Europe. Despite many archaeologists having moved beyond culture–historical approaches, the El Argar site, with its more than 1,000 tombs, is still a key reference point for understanding the prehistory of south Iberia. Both sites are nucleated settlements, no larger than 3 ha and about 5 km from each other, which occupy two small plateaux near the River Antas. Lugarico was in use in the Late Chalcolithic period and abandoned in the Early Bronze Age when El Argar became the dominant site in the region around 2200 BCE (Legarra Herrero 2014).

The conception of a linear history of the region, organised as a succession of nucleated sites, extends back to the Neolithic period. The site of La Gerundia on a hill adjacent to El Argar was identified as the main type site for the Neolithic period based on the nineteenth century CE excavations there (Siret and Siret 1890; Deramaix 1992). For the Chalcolithic period, the site of El Garcel (Figure 2), a few hundred metres south of El Argar, is the main type-site for the region (Acosta Martínez 1995). It is unclear why humans moved from one hilltop to another across the periods, but the interpretive framework is based heavily on a culture–historical sequence of the region. Around 1500 BCE El Argar was abandoned and there is little evidence of settlements in the broader region until 1000 BCE with new sites closer to the coast (Chávez Álvarez et al. 2001).

Archaeological knowledge of the area remains limited. Excavations more than a century old have only been succeeded by a small excavation at El Argar in 1991 (Schubart and Marzoli 2015) and at El Garcel in the 1970s, the latter never published in detail but recently restudied (Acosta Martínez 1976; Román Díaz and Maicas Ramos 2018; Maicas Ramos and Román Díaz 2019). In the 1980s, the area was subject to two surface surveys (Delibes et al. 1996; Camalich Massieu and Martín Socas 1998) and palaeoecological studies (Castro et al. 1994; Castro et al. 1998; Castro Martínez et al. 1999), which helped to identify sites in the area but provided little information with which to characterise them. Therefore, questions remain about the size of the various sites in the region and the history and nature of their use (Legarra Herrero 2014). The methodology of the previous surveys was never published in detail, making it difficult to retrace their interpretation.

Re-discovering a landscape: the 2018 and 2021 VERASUR surveys

Against this background, a new project lead by the UCL Institute of Archaeology and the University of Granada was established with the aims outlined above, including a survey methodology designed to: (a) improve the characterisation of known sites in terms of size, cultural patterning and history of use; (b) understand better the landscape between the known sites; and (c) assess the preservation of sites after abandonment. The project adopted a survey methodology based on contemporary projects in the Aegean, such as the Knossos Urban Landscape Project in Crete (Whitelaw 2012), and on advances in the knowledge of prehistoric ceramics in the region (Vico Triguero et al. 2018; Vico Triguero et al. 2020). Recent geo-referenced aerial images as well as LiDAR data and digitised historic maps available through the Centro Nacional de Informacion Geografica combined with hand-held GPS devices on the ground facilitated an accurate field methodology at a much faster speed than was possible just a few years ago. Representatives of the town of Antas helped with local knowledge and logistical support. In addition, the study of excavated material from the region housed in the Museo Arqueológico Nacional (MAN) in Madrid has been crucial in re-evaluating the material we have collected. In the three campaigns to date, several teams surveyed the landscape around the River Antas in 100 m² (10 m × 10 m) units (Figure 2). The survey teams targeted the numerous flat hilltops of the area, as the low-lying areas in between were heavily affected by torrential rains and seasonal streams of water. Furthermore, the survey did not cover areas under modern cultivation as these had been heavily transformed in modern times with the use of bulldozers to level them. In each 100 m² unit, a 10-m² area at its centre was sampled whereby all anthropogenic materials were collected, labelled and removed for cleaning and detailed study; the rest of the unit was walked and if extraordinary material was found, it was collected and documented and kept separate from the systemic sample for study. An electronic form was completed for each unit, establishing basic variables such as vegetation and modern land use. Specific areas of interest, such as structures or looting pits, were recorded as *puntos de interés*

(points of interest), each with its own record, including photographs. In certain areas with no apparent surface finds, 400 m² (20 m × 20 m) units were walked through in two 1-m wide mini-transects, each 10 m apart, collecting all materials for study. In general, very little material was collected in the 400 m² units, discounting intensive human use in prehistory in these areas. All materials were washed, photographed and studied in 2019 and 2022–23. Ceramics were studied by Laura Vico Triguero and Jesús Gámiz Caro, lithics by Cristine Bermúdez Guerrero and Antonio Morgado Rodríguez, and archaeometallurgical materials by Mercedes Murillo-Barroso and Aaron Lackinger.

Methodological clarifications

The collection and identification of Chalcolithic surface material in the area presents challenges (Figures 3 and 4). The ceramics are handmade with a soft paste due to their low firing and do not survive well when exposed on the surface. The pastes tend to contain a more heterogeneous, poorly sorted mix of temper than Bronze Age pottery, although there is no clear distinction between the two. Most Chalcolithic ceramics are plain with little decoration (Figure 3). However, the use of light burnishing is a good criterion for distinguishing them from the heavy burnishing typical of the Bronze Age. The combination of several of these traits can help in assigning ceramics to the Chalcolithic period. In many cases, idiosyncratic typological characteristics of the period help to confirm dating, such as almond-shaped thickened rims or flat outward rims (Figure 3). While decoration is rare, one Bell Beaker sherd (Figure 3, third row left) and one with incised decoration (Figure 3, bottom right) define the transition between the Chalcolithic and the Bronze Age (Hernández Pérez et al. 2021). Although clearly datable material accounts for a small portion of the material recovered, the rest of the assemblage can be broadly identified as prehistoric or otherwise due the formation techniques (hand-made) and the heterogeneous nature of ceramic fabrics.

At several sites, most of the material is prehistoric (Figure 5a), with a few sherds identified more specifically as Chalcolithic. In these instances, we take into consideration the absence of Bronze



Figure 3 Examples of diagnostic ceramics found on the survey. Numbers refer to the coordinates in ETRS 1989 UTM Zone 30S

Age ceramics that due to their harder-fired fabrics, the use of heavy burnishing and more homogeneous tempers, are easier to identify. At the opposite chronological end, excavations in the region show that

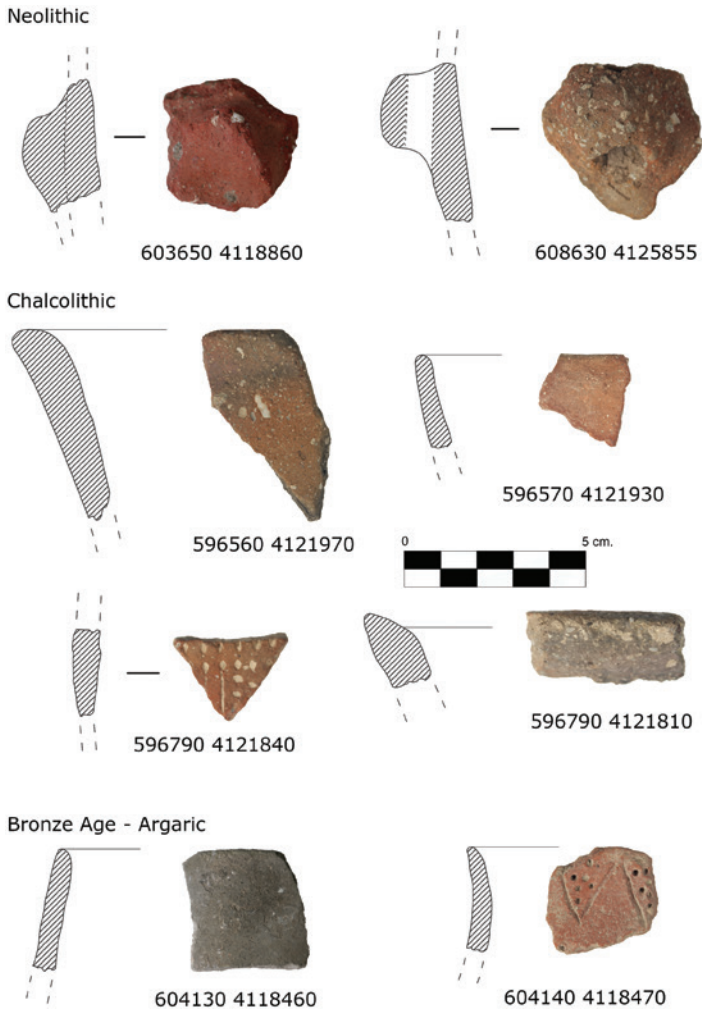


Figure 4 Satellite image of the River Antas with distribution of Chalcolithic material found in the survey

Neolithic ceramics are scarce, with poorly sorted tempers and low-temperature firing, making them easily degradable when exposed on the surface; their absence cannot thus be used to reject the Neolithic use of sites.

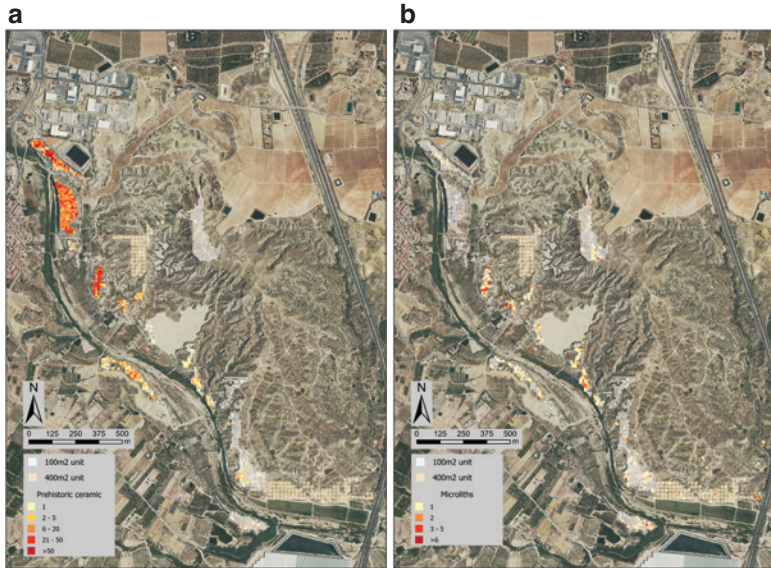


Figure 5 Aerial image of the River Antas with (a) Distribution of Prehistoric ceramics in the area of study; (b) Distribution of microliths in the area of study

The dating of the sites can be assisted by the study of microliths (Figure 5b) as recovered in large quantities in the 1880s (Siret and Siret 1890) and 1970s (Román Díaz and Maicas Ramos 2018) excavations at El Garcel. They seem common in the Neolithic and Chalcolithic periods, but less so in the Bronze Age. Therefore, the presence of microliths can support the identification of the period of use in certain areas of the region. This is further aided by the recognition of certain microliths and lithic items as typically Neolithic-Chalcolithic such as stone bracelets (Martínez-Sevilla 2018).

The VERASUR survey divided the area into different ‘sites’, each with a designation (Figure 2) based on a combination of geographical traits, fieldwork logistics and known archaeological evidence. However, these sites do not necessarily refer to independent units of human activity in the landscapes. Some coincide with the classic sites (El Argar, La Gerundia, El Garcel), while others refer to hills not previously known to display any archaeological remains.

Results

The site of El Argar yielded a significant amount of Chalcolithic material, particularly at the east side of the site (Figure 3), despite the presence of thick layers of Bronze Age habitation potentially masking earlier occupation (Schubart and Marzoli 2015). Regardless of the Chalcolithic material previously known at the site (Lull 1983, 246; Carrilero Millán 1991, 687; Pellicer Catalán 1995, 123; Schubart and Marzoli 2015, 73–5; Hernández Pérez et al. 2021, 94), the quantity of material encountered was unexpected, indicating that El Argar was more heavily occupied in the Chalcolithic period than previously acknowledged.

The survey also documented Chalcolithic use at La Gerundia, confirming materials reported from the site as Bell Beaker (Deramaix 1992, 106). La Gerundia is known in the literature mainly for its Neolithic occupation (Siret and Siret 1890; Fernández-Miranda et al. 1993; Acosta Martínez 1995), although no modern excavation has been conducted. The density of materials found in our survey suggests significant use of the hill in the Chalcolithic period.

The quantity of Chalcolithic material found at El Garcel corroborates existing accounts (Román Díaz and Maicas Ramos 2018; Maicas Ramos and Román Díaz 2019). These recent works also identified El Garcel 2 site (Román Díaz and Maicas Ramos 2018), another Chalcolithic occupation on a hill nearby not reported in the Siret's publication. Not only has our survey located this second site, but also Chalcolithic material on two other adjacent hills. On the larger of the two additional hilltops (El Garcel 4), the density of finds appears to diminish to the west and away from the river, marking the end of the distribution that starts at El Garcel.

The survey also recovered Chalcolithic finds on other hills both sides of the river (named Cerro 4, 5, 6 and 7). The densities are lower than on the El Argar and El Garcel hills, with the exception of Cerro 7, where more significant amounts of material were found. Very few sherds have been identified as Chalcolithic in these areas but, given the number of prehistoric sherds, the absence of clearly identifiable Bronze Age materials and the presence of microliths, we are inclined to consider the material spread across the hilltops in this Cerros area as indicative of Chalcolithic, possibly Neolithic, use. Surface material seems to diminish to the south

and away from the river (Figures 3 and 5a). In the 1980s a survey identified Chalcolithic sites near these Cerros (Camalich Massieu and Martín Socas 1998: 337, sites 165, 167 and 168, 590–4), although these were not described in detail, and without their exact location matching them with our survey results is difficult. Cerro 7, also known as La Cañada del Cura (Camalich Massieu and Martín Socas 1998, site 167) is the only site that can be matched with the older survey.

Situating our results within the broader region helps to contextualise the new evidence. Chalcolithic material, for example, has been reported near to the modern village of Antas, close to the river, not far from our survey area (Camalich Massieu and Martín Socas 1998, site 215). Unfortunately, the area is heavily built-up and inaccessible for survey, but nevertheless indicates further Chalcolithic material north of Cerro 7. Another site worthy of note is Cabecicos Negros (Figure 1; Goñi Quinteiro et al. 2003), c. 10 km down-river on a hill adjacent to the probable estuary of the river in prehistoric times. The site has been subject to limited excavation (Goñi Quinteiro et al. 2003) and is confidently dated as Neolithic–Chalcolithic. Our survey in Cabecicos recovered several Chalcolithic sherds in an otherwise undiagnostic prehistoric assemblage. The 1980s survey reported another Chalcolithic site (Camalich Massieu and Martín Socas, 1998, site 165) by the river between Antas and Cabecicos, but recent agriculture and bulldozing of the fields mean that the area between modern Antas and Cabecicos Negros is unsuitable for intensive survey. Thus, further Chalcolithic occupation may have existed between the El Argar area and Cabecicos Negros, but which is no longer preserved. The only known Bronze Age sites near the river are Fuente Vermeja (Figure 1; Siret and Siret 1890), a site just 2 km upstream from El Argar, apparently no longer preserved, and Lugarico Viejo, 5 km upstream and probably abandoned early in the Bronze Age (Figure 1; Ruiz-Gálvez et al. 1990).

Discussion: rethinking Chalcolithic settlement along the River Antas

The Chalcolithic settlement pattern around the middle River Antas has been traditionally understood as formed by clearly delimited sites

(Camalich Massieu and Martín Socas 1998, 337), with the main site located on the El Garcel hill with smaller satellite sites nearby, including a few burial sites.

Intensive survey by the present project has provided new evidence to challenge this view. New results reveal a distribution of Chalcolithic materials that extends across a larger area along the banks of the river reaching the modern village of Antas north of Cerro 7. A higher density of finds appears not only at El Garcel but also at La Gerundia, and probably in El Argar, opening the possibility of a focal area of densely occupied Chalcolithic habitation significantly greater than previously thought. Archival evidence further indicates that the lower density materials we have discovered along the river (Cerro 4 to 7) should not be considered funerary as previously thought, since *silos* (pits) have been reported that fit better with a habitational use (Maicas Ramos and Román Díaz 2001, 20). Sites have undoubtedly been lost along the river to erosion and modern landscaping. Given the location of a large site at the estuary of the river (Cabecicos Negros) and anecdotal evidence of finds located along its banks, the possibility exists that a variable density of Chalcolithic occupation could have continued along the river from the sea to the Antas area and potentially beyond.

The possibility of occupation across a relatively large area with variable density fits well with what is known now from other contemporary sites (Márquez Romero and Jiménez Jáimez 2010; Jiménez-Jáimez and Suárez-Padilla 2020). Although in this case we have not found the ditches and walls that define other Chalcolithic settlements, the river may be connecting different occupied promontories, offering areas for intensive cultivation and adding a sense of place that structured human activity in this area. The occupation of the middle and lower course of the River Antas also matches the pattern of other Chalcolithic sites such as Los Millares and Valencina de la Concepción with regard to favouring strategic locations at key geographic routes between the coast and fluvial valleys.

Within this general characterisation, better chronological resolution is required to understand the exact nature of the Chalcolithic settlement, a notion that requires excavation. Occupation of the various hilltops along the river need not be contemporaneous, but if La Gerundia, El Argar and El Garcel were in use at the same time, they

would have formed the core of a large, relatively densely occupied settlement given the amount of material found on the ground surface. The low-density material found in the Cerros, nearby these three main locales, may be the result of a pattern of fluid settlement at the edge of the posited core, or even reflective of seasonal patterns of use extending as far as the estuary of the river, where densely occupied core settlement appears again at Cabecicos Negros. An alternative explanation might be that differences in surface material density relate to changes at the end of the Chalcolithic period, when there is a trend towards more densely occupied settlements with defensive architecture that eventually develop into the compact sites typical of the Bronze Age (Ramos Millán 2013; Peres and Risch 2022). The high density of material at La Gerundia/El Argar/El Garcel hilltops could be explained by populations concentrating on these hilltops at the end of the Chalcolithic period, as seems to be the case at Lugarico Viejo a few kilometres upstream. Such a process of nucleation may have ended with the establishment of El Argar as the only settlement in the Bronze Age. Such a view might mean that the low-density early Chalcolithic material found along the River Antas represents extensive settlement without a strongly defined hierarchy.

Conclusions

The project so far demonstrates the value of new methods in the pursuit of higher-quality and higher-resolution data for the prehistoric occupations of the Mediterranean landscapes of Iberia that expands the limited information provided by excavations in the region. Without intensive survey, small- or low-density occupations are difficult to identify and demonstrate the importance of applying new methodologies to known sites in order to discover the full complexity of prehistoric settlement patterns.

The preliminary results of the survey highlight similarities between this region and broader south Iberia in the fourth and third millennia BCE (Díaz-del-Río 2023). The middle and lower River Antas emerges as a relevant case study for understanding the heterogeneous spatial and temporal patterns that mark Chalcolithic settlement systems in Iberia (García Sanjuán et al. 2017). Furthermore, the patterns observed open broader discussions about the nature and identity of the community ties

that created these settlement systems and the unequal–dependent relationships between and among the inhabitants of these sites.

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Declarations and conflicts of interest

Research ethics statement

Not applicable to this article.

Consent for publication statement

Not applicable to this article.

Conflicts of interest statement

The authors declare no conflicts of interest with this article. All efforts to sufficiently anonymise the authors during peer review of this article have been made. The authors declare no further conflicts with this article.

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