

Directing the eye. The Côa Valley Pleistocene rock art in its social context

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The modern recognition of the Côa Valley Rock Art in North-eastern Portugal was a true Copernican revolution in the context of the Upper Palaeolithic rock art (Zilhão et al. 1997). The number of engraved panels and the dramatic context of their finding opened new perspectives to the oldest European artistic expression outside caves.

The Côa Valley remains the largest concentration of open-air Palaeolithic rock art. Of a total of 1.183 rocks identified until 2013, 533 present stylistically Upper Palaeolithic motifs, distributed through 82 different clusters (Reis 2014) (**Fig. 1**).

The 132 fully documented supports present 1.115 figurative Palaeolithic motifs, mostly inscribed on vertical joint-fracture pre-Cambrian metamorphic surfaces (Aubry, Luís and Dimuccio 2012), and only two on Hercynian granites. Archaeological excavations have yielded 80 portable engraved plaques and pebbles and one painted pebble (Aubry 2009).

Rock art context

The Upper Palaeolithic Côa Valley settlement is defined by 22 sites securely identified on surface, 15 of which have been excavated or surveyed (Aubry 2009). These sites are divided in two different types according to their location on the granitic Pliocenic plateau or on the river valley bottoms. The sites on the plateau document brief but frequent hunting related activities, documented by discarded retouched bladelets and points, associated with large lithic fire structures, in the context of seasonal pond formation during defrosting. The second type of sites have yielded complex structures suggesting longer and residential occupations, preserved in low energy slope deposits.

Stratigraphy, stone tool typology and radiometric dating (TL, OSL and AMS) document eight different phases of Upper Palaeolithic settlement in the area, dating from Middle Gravettian to Azilian (**Table 1**). With the exception of the Protosolutrean phase, only documented on the plateau, all other phases show complementarity between plateau and river bottom sites, some of which recurrently used during the Upper Palaeolithic.

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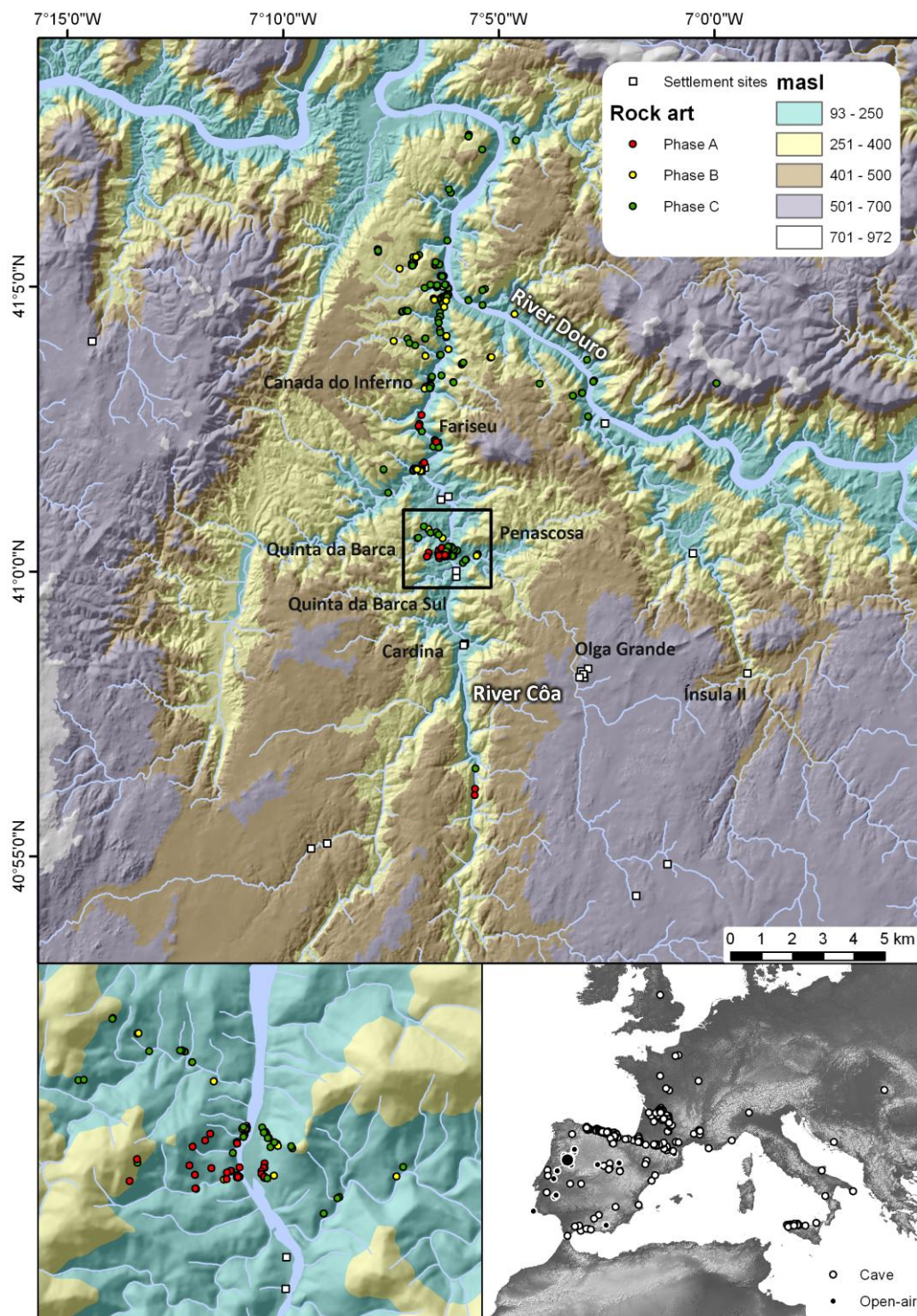


Fig. 1. The Côa Valley Upper Palaeolithic rock art and settlement.

Table 1. Stratigraphic and radiometric data of the Côa Valley Upper Palaeolithic settlement and its relation with rock art phases. TL and OSL dates correspond to calendar years. AMS were calibrated using OxCal 4.2. with IntCal 13 curve (95,4% prob.).

<i>Settlement Phase</i>	<i>Site</i>	<i>Layer</i>	<i>Dates</i>			<i>Artistic Phase</i>
			<i>Max</i>	<i>Min</i>	<i>Method</i>	
7	Cardina I	4 top	-	-	-	Phase C
	Cardina II	2	-	-	-	
	Quinta da Barca Sul	3 base	13.700	11.700	TL	
			13.000	10.800	TL	
			12.800	10.400	TL	
	Fariseu	4	12.700	10.900	TL/OSL	
			12.100	9.900	TL/OSL	
			12.500	9.100	TL	
12.601			12.244	AMS		
			11.759	10.781	AMS	
6	Cardina I	4,3/6	-	-	-	Phase B
	Olga Grande 4	2b	-	-	-	
	Fariseu	6b	16.800	13.600	OSL	
			15.400	13.200	TL/OSL	
			14.700	12.700	OSL	
	Fariseu	8	20.000	16.800	OSL	
5b	Olga Grande 4	2a/b	-	-	-	
	Olga Grande 14	2	-	-	-	
	Fariseu	9 top	23.175	22.595	AMS	
5a (?)	Cardina I	4,7/8	-	-	-	
	Olga Grande 14	2b base	-	-	-	
4	Olga Grande 14	2c	-	-	-	
	Olga Grande 4	3 top	-	-	-	
3	Cardina I	4,9/10	-	-	-	
2	Cardina I	4 base	30.100	25.900	TL	Phase A
			29.300	26.300	TL	
			28.800	25.200	TL	
			28.300	24.700	TL	
	Olga Grande 14	3	-	-	-	
	Ínsula II	2 top	-	-	-	
1	Olga Grande 4	3	33.500	28.500	TL	
			32.400	27.600	TL	
			30.800	26.200	TL	
			29.500	24.900	TL	
			29.100	24.500	TL	
	Cardina I	4b	31.600	28.600	TL	

Within the river bottom sites a subtype emerges in direct relation with rock art, preserved due to a succession of low energy slope and alluvial deposits, represented notably by panel 1 from Fariseu. Its discovery and excavation was a milestone in the study of the Upper Palaeolithic (Aubry 2009).

Phasing

The Côa Valley Palaeolithic rock art can be divided in three groups (Santos 2012) (**Fig. 2**). The first is characterized by the predominance of aurochs, horses and ibexes, with less common red deer and residual chamois and fish. It is characterized by large bellies, rounded hips, and naturalistic heads with few or no anatomical details. Usually, only two legs are represented, normally without hoofs; only one horn is observed, or both in a straight or oblique biangular profile; tails and dorsal lines are very formalized, according to each species. Very simple signs are also present. The pre-Magdalenian chronology of this phase is attested by the relation between the rock art sequence of Fariseu's panel 1 and the archaeological stratigraphy partially covering it, providing a minimum age of 18.400 ± 1.600 years (Aubry, Santos and Luís 2014).

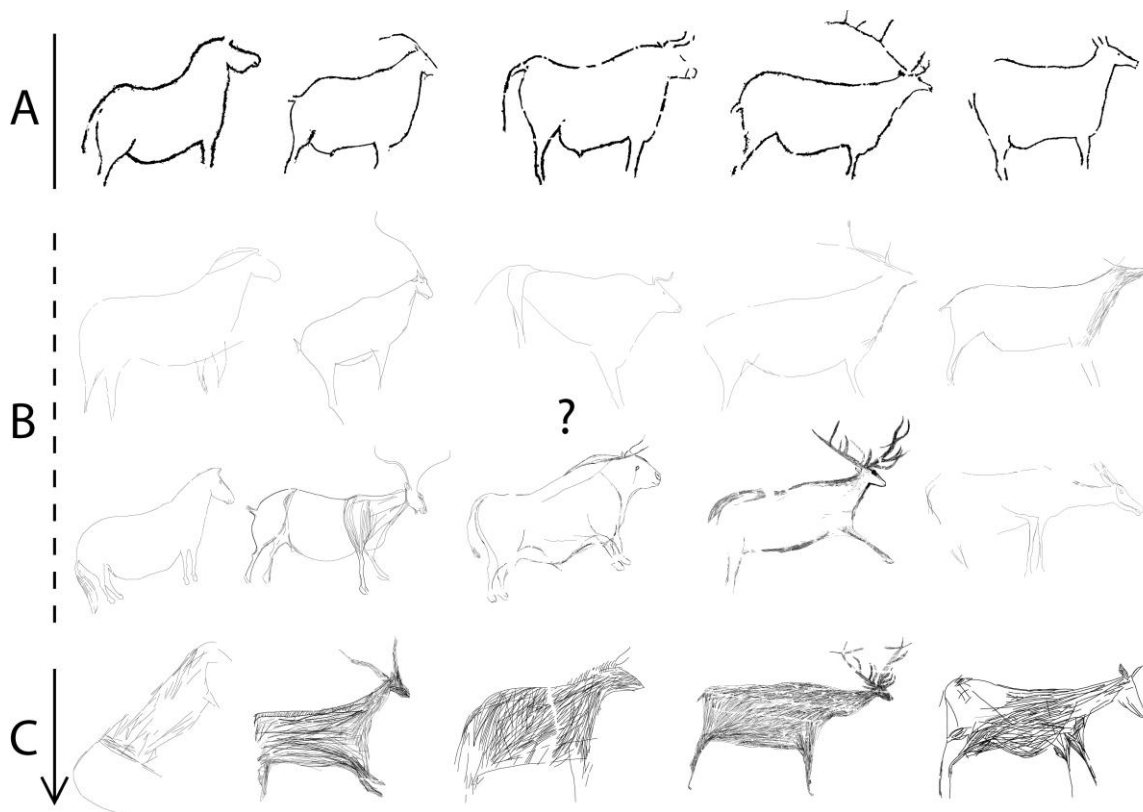


Fig. 2. Artistic phases for the main species depicted in the Côa Valley Upper Palaeolithic rock art.

The second phase corresponds to Leroi-Gourhan's style IV, some clearly inscribed in early style IV, along with other - sometimes in the same panel - that would be classified as late style IV. If stylistic parallels, namely from the north of Spain, suggest a Magdalenian chronology, only local stratigraphic context will contribute for its chronological precision. Compared with the previous phase, the main thematic change is the appearance of *Homo*, with 24 representations, 20 of which in the same panel. The number and variety of signs increases.

The third phase is characterized by geometrised zoomorphic figures, usually with four legs in an oblique or straight biangular perspective; legs have usually a triangular shape, with a clear, but schematic, difference between thighs and canons; no anatomical details are visible. The bestiary of this period is dominated by the red deer, followed by ibexes and horses, with fishes and aurochs as residual species. The chronology of these figures is well established by the finding of 76 examples of portable art inside Fariseu's Azilian layer 4, dating from 12.770 to 10.700 calBP.

Beside differences in style and motifs, these phases can also be distinguished in terms of geographical distribution and panel density. Average neighbour distance states that all three phases are highly clustered with less than 1% likelihood it could be the result of random chance.

Non random clustering of Upper Palaeolithic rock art is in part related to tectonics forcing and differential preservation (Aubry, Luís and Dimuccio 2012). Heatmaps produced using ArcGis' Kernel density tool and differences between phases show that phase A is concentrated in two main areas, Quinta da Barca/Penascosa and Canada do Inferno, with other minor concentrations. Panels from phase B are more dispersed with a more northern location reaching the mouth of the Côa. This tendency is accentuated in the next phase, with heavy concentration at the confluence of the Côa with the Douro and an intensification of the occupation of the Côa and Douro tributary valleys.

Phase C shows higher altitude, distance to water streams and, to a lesser degree, slope inclination. Accordingly, phase A occupies mainly deeply incised streams and U-shaped valleys, while B and especially C occupy open and upper slopes and ridges.

All phases generally occupy slopes that are perpendicular to the main tectonics direction (40°). Aspect is directly related to solar radiation, which is relevant in terms of preservation (Aubry, Luís and Dimuccio 2012), thus, the most ancient phase presents the highest minimum solar radiation exposure and the most homogenous values.

We have analysed two types of visibility: legibility, which determines the ease or difficulty of a reader to recognize motifs or compositions on the panel, and viewshed, that defines the area visible towards the landscape from the panel.¹

¹ This means that the viewpoint will necessarily be also visible from any other point in the viewshed area. Whether it will be easily perceptible in the context of its surroundings shall depend on the conspicuousness of the panel in relation with the surroundings, notably its size and/or color.

Rock art legibility depends on design, size, technique of representation and contrast. Phase A is characterized by figures from 220 to 17 cm, represented through highly visible techniques, like simple pecking (~145 m) and abrasion (~110 m) (Aubry and Luís 2012). Fine line incision (~30 m) is also present, as well as red painting. Painting is only known against a clearer granitic support, where pecking and abrasion are less visible. This phase presents the highest frequency of motif superimposition, which influences readability negatively.

Techniques used in phase B, mainly single and multiple fine line incision contours and exceptionally thinner abrasion with no previous pecking are generally less visible. It is possible that pecking could be much more important, like in the case of nearby Siega Verde, but it might be hidden by floodplain sedimentary dynamics. Design is less standardized than the previous phase and more naturalistic. Motifs are 170 to 6 cm and superimposition is rarer than in the previous phase.

Besides their size (from 60 to 1,7 cm), Azilian geometrization makes some animal motifs, even though they are from and involved in few superimpositions. Techniques include pecking and red painting over granitic panels, but mostly fine line incision with line body filling (~55 m).

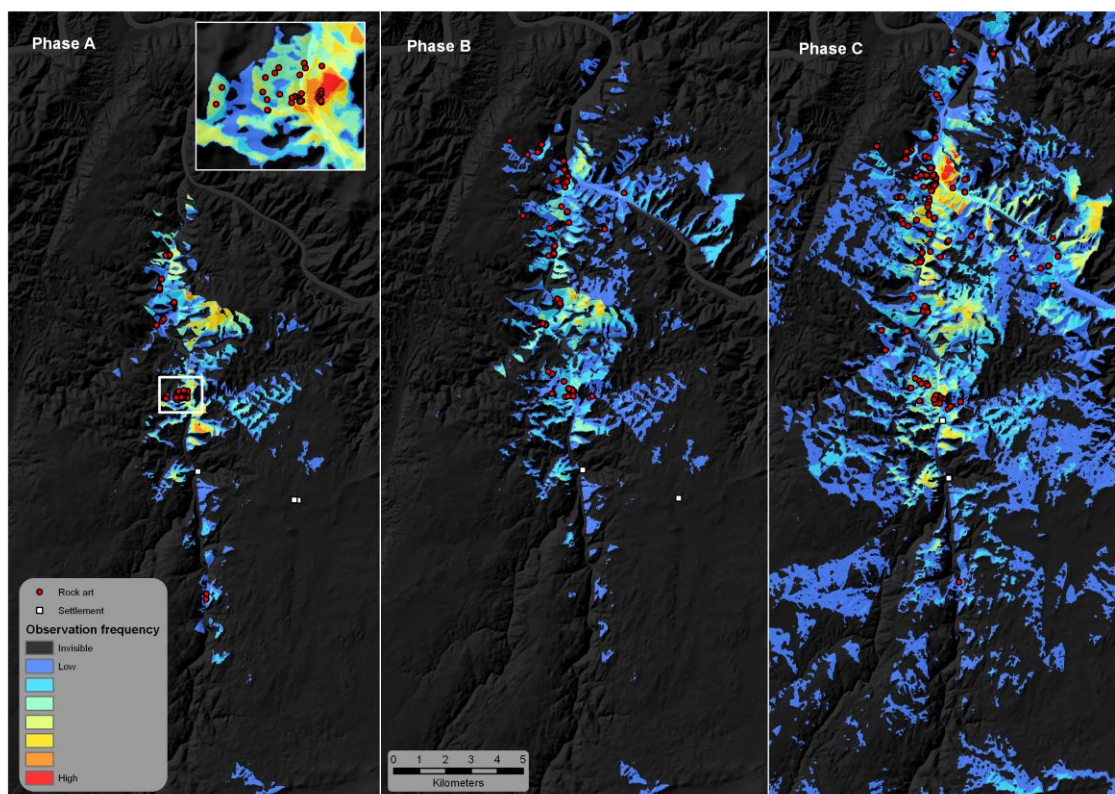


Fig. 3. Total viewshed and observation frequencies for the three phases of the Côa Valley Upper Paleolithic rock art.

Visibility was analysed through ArcGis's Spatial Analyst toolbox (**Fig. 3**) for the totality of the panels from the different phases. Phase C presents the highest total and mean visibility, and A

the lowest. The interpretation for this fact lies on the aforementioned fact that there is an increase in absolute altitude from phase A to C.

Intervisibility gives us a more significant resolution of total viewshed analysis. Observation frequency by artistic group shows that group A panels present less mean visibility but more areas with higher observation frequencies, when compared with groups B and C. This means that the areas seen from phase A panels are more commonly shared with other panels viewshed. Phase B and C present higher absolute viewsheds, but they are not generally shared with other panels from the same phase. Therefore, there are more panels from phase A seen from other panels of the same phase.

Social context

Based on the archaeological study we have shown that there are differences in terms of visibility between the different phases and even within phases.

The pre-Magdalenian phase is clearly public, located in dense clusters of intervisible panels, with highly legible, even if not easily readable motifs, due to dense superpositions. This is particularly significant at Penascosa and Quinta da Barca, and, to a lesser extent, Canada do Inferno, which presents the higher number of mutually visible panels, surrounding river beaches from where a large number of panels can be perceived.

This phase of the Côa Valley could be related with large structures, both on the plateau and river bottom sites, resulting from collective construction and use.

Raw material sourcing of the pre-Magdalenian phases places the Côa Valley in the centre of a large network, from the centre of the Iberian Plateau to the littoral Portuguese Estremadura. Based on this fact, the Côa Valley can be perceived as an aggregation site, concentrating dispersed but related bands (Aubry et al. 2012).

Even though the number of known rock art panels increases in the Magdalenian and Azilian, probably due to conservation issues, their nature is less public, legible and intervisible. In phase B rock art seems related with meaningful places (Santos, 2012) and in phase C it is more generalized but dispersed. Total visibility is more important, but the eye is directed to areas with no rock art. Settlement sites are essentially the same, but structures are smaller and more dispersed. This also relates with the raw material supply network which continues to be essentially the same, but its intensity decreases.

The Côa Valley open-air rock art and its context show us a change through-out the Upper Palaeolithic from more conspicuous and collective to hidden and atomized.

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