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IMPORTED MARBLES FOUND IN THREE ROMAN CITIES OF THE TERRITORY OF "CINCO VILLAS" (ZARAGOZA), NORTH OF *HISPANIA CITERIOR*

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Abstract

The archaeological remains of three Roman cities placed in the most northern part of the Hispania Citerior province, in the demarcation of the ancient Augustan colony of Caesar Augusta, are currently under a multidisciplinary study. Located along the road that once connected the Ebro valley with the Pyrenees, they include Los Bañales (Uncastillo) and the small municipalities of Campo Real (Sos del Rey Católico) and Cabezo Ladrero (Sofuentes), all in the modern province of Zaragoza. By Augustan times, they probably started to become monumental, and became municipia in the Flavian period.

The reopening of the recent archaeological research carried out in the mentioned area together with the implementation of a multi-method archaeometric study have provided a better knowledge of the stone resources and about the selection of imported marbles for special goods. Apart from varieties of the nearby Saint-Beat marbles, the attested catalogue includes other well known quarry sources like Carrara, Paros and Docimium.

Keywords

Roman marbles, urban development and architecture, Archaeometry

Archaeological overview

The recently archaeological research carried out in the current territory of "Cinco Villas" (Aragón, region) has lightened the existence of different Roman cities. This territory is located on the northwest area of the Zaragoza province right in the place where the native *Vascones* lived (BELTRÁN LLORIS 2001), in the North of the *conuentus Caesaraugustanus*. These Roman towns were emplaced along the way of the Roman road that connected Caesar Augusta (Zaragoza) with Pompelo (Pamplona). This Roman road was, in fact, part of a main route that connected the Mediterraean coast with the Cantabric Sea and the Ebro valley with the Pyrenees. This route from Tarraco (Tarragona) to Oiasso (Irún) (MORENO 2009) was operative from the 1st century BC to the end of the 4th century AD.

One of these Roman towns was "Los Bañales" (near the current village of Uncastillo), whose name probably was Tarraca in ancient literature (ANDREU 2012a). A second was Cabezo Ladrero (modern Sofuentes) (JORDÁN *et al*. 2010) and the last one considered in this paper, was situated in Campo Real (current Sos del Rey Católico and probably ancient Arsaos) (ANDREU *et al*. 2008) (Fig. 1). The territory was scattered with other Roman emplacements such as that settled in the modern Ejea de los Caballeros, possibly named Segia in the latin sources (CABELLO y PAZ 2006), or those like "Santacrís" (Eslava) and Ilumberi (Lumbier) – both in Navarre region –. All of them were promoted by the Romans from native towns just by the time of Augustus, between 15 and 9 BC. The territory lived its *floruit* from the end of the 1st century BC to the end of the 2nd century AD and began to decline after the urban convulsions of the 3rd century AD. During that prosperous time all of these cities seem to become Flavian municipalities and developed an intense process of urbanization from which only is well known that concerns to the city of Los Bañales, thanks to the results of the archaeological campaigns developed in the last four years (ANDREU 2012b, 29-49)[5].

One of the topics in this archaeological research is the supply of raw material to achieve the process of urbanism. In Los Bañales, local Miocene sandstone was widely exploited for building and infrastructure purposes as is evidenced not only by the large quantity of architectural elements found *in situ,* but also by the vestiges of exploitation as quarry faces and marks of ancient

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5. A research project leaded by Fundación Uncastillo with the permission of Dirección General de Patrimonio of the Aragon Government. For further details: http://www.losbanales.es.

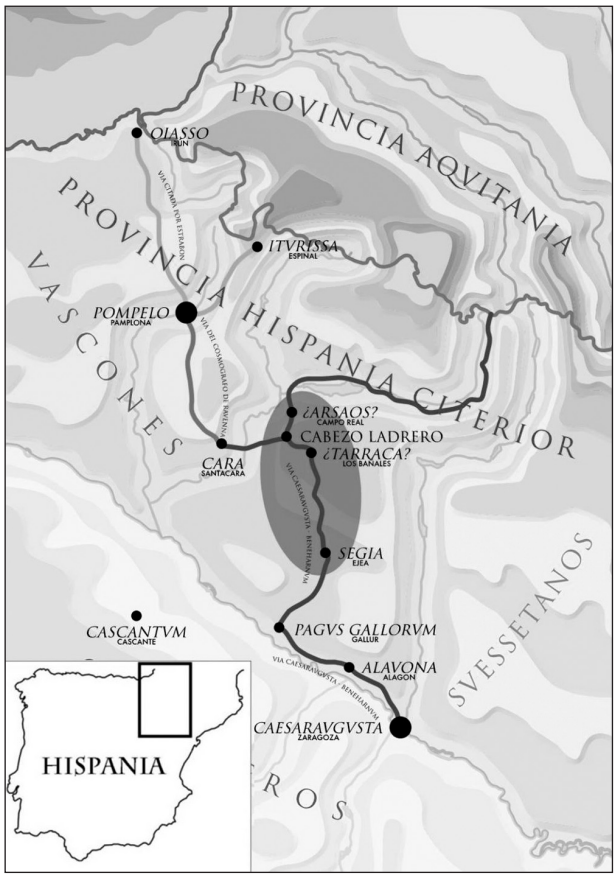

Fig. 1. Historical and geographical context with the general location of the territory of Cinco Villas (ellipse area) and the major Roman cities from where the pieces under study were found: Los Bañales/Tarraca, Campo Real/Arsaos and Cabezo Ladrero.

works found in the surroundings (GUTIÉRREZ GARCIA-M. *et al*. 2012, 653-654). Concerning noble stones, white marbles and coloured varieties were also identified in different architectural-decorative elements (LAPUENTE *et al*. 2012b, 281-286). To better understand the use of selected marbles in this territory, this paper is focused on the marble identification of different artifacts recently found in the archaeological remains of three emplacements of the "Cinco Villas" territory: Los Bañales, Campo Real and Cabezo Ladrero.

The studied samples

From the coloured *Marmora,* nineteen were found in Los Bañales and one additional piece comes from Campo Real. Most of them correspond to slabs fragments, but there are also one molding fragment and one small cosmetic plate (Fig. 2).

Regarding white pieces from architectural elements and statuary, 13 samples were studied, all in diverse state of fragmentation. The list of material is displayed in Fig. 3 and they are shown in Fig. 4.

During the 2009 campaign of archaeological excavation in Los Bañales focused on the area near the bath complex building, a small molding marble piece was found (no. 1).

In the southern part of the city, close to the fields down to the bath area, slabs fragments for pavements were found several years ago[6] (nos. 2, 3, 4, 5, 9). With respect to the statuary, the studied samples from Los Bañales were discovered during the 2011 campaign of the archaeological excavations carried out in the Forum which probably was built at the end of the 1st century BC. They were found in a level of abandoned structural material (*spolia*) used for closing the ancient street of the city, before the junction with the access to the Forum. These pieces are two fragments of fingers, a foot with the evidence of a shoe (*calliga*), two pieces of the clothing (*paludamentum*) of a sculpture (nos. 6 and 7), one of them with an arm and both with evidences of been colored with red pigment, as was usual in Roman sculpture (BENDALA 2009). Finally, a right hand without fingers (sample no. 8) completes the list of analyzed white marbles from Los Bañales.

Recently, in the 2012 campaign, more fragmented pieces were recuperated from a pile supposed to be ready for their destruction and conversion into lime. They were originally from the decorative program of the Forum and include part of the decoration of a *thoracatus*, some attributes, a finger, some drapes and clothes and an additionally hand of another sculpture[7]. They will be the aim of future analyses.

In Campo Real, located right on the limits of the current municipalities of Sos del Rey Católico (Zaragoza) and Sangüesa (Navarra), a beautiful marble artifact which seems to be the top part of a *cornucopia* (no. 12), were analyzed. The spectacular *cornucopia* carved with the use of the drill, seems to be part of an imperial or religious statue of monumental size. It was found in the area of Baratiñones, where probably an ancient rural settlement related with the Roman city of Campo Real was emplaced (ANDREU *et al.* 2011).

Finally a fragmented inscription plate (no. 13) found in Cabezo Ladrero constitutes the list of studied samples. This last piece was found exactly in a possibly *uicus* of its rural territory, "La Pardina de Vico", which seems to be a previous indigenous city, evolved in Roman times for economic purposes (ANDREU *et al*. 2010, 126-127).

In order to complete the inventory of the marble artefacts recently discovered in this territory, two small columns shafts (nos. 10 and 11) probably from the same piece, have also included in this paper, in spite of have been aimed in previous papers (ANDREU *et al.* 2010,

6. Thanks to J. Planas for the sampling facilites.
7. M. Laita, a private neighbor, found it by chance.

Fig. 2. Selection of archaeological elements in different coloured stones found in the Cinco Villas territory. Green and Mixed Campan (France), Giallo antico and Lumachella orientale (Tunisia), Rosso antico, Verde antico and Cipollino verde (Greece), and *Luculleum* (Turkey). The fragments shown were specifically found in Los Bañales.

184; ROYO 2012). Both small columns (20/22 x 20/11 cm) founded by some privates in the area close to the ancient cemetery of the city of Campo Real and could be part of an ancient *lararium* for domestic cult.

Archaeometrical study

The characterization and identification of white and coloured *marmora* varieties have been carried out separately since their methodological approach is different. Among the latter, lithological varieties are well visually recognized through their colour and patterns by the presence of veins or bands which facilitates the comparison with pictures of *marmora* exploited in ancient times, published elsewhere[8] and also with an extensive collection of breccias and other rocks[9] commonly used in antiquity. The list of the identified provenance of the slab fragments is as follows: Two in Green and Mixed Campan, one in Giallo Antico, one in Lumachella Orientale, one in Rosso Antico, two in Verde Antico, ten in Cipollino Verde, and one small cosmetic plate or *coticulae* in *Luculleum* (Andreu in press). The moulding fragment was carved in Lumachella Orientale, and the slab fragment from Campo Real in Green Campan. A selection of the most representative *marmora* fragments is shown in figure 2.

Additionally, the study of white marbles involves the application of various analytical techniques. Optical Microscopy[10], Cathodoluminescence (CL)[11] and for C and O isotopic determination[12] were applied to thirteen marble artifacts discovered in the 2011 campaign. The multi-method carried out provides a great reliability to the results of the provenance marble sources, as numerous works have been demostrated. The marble quarry was assigned after the comparative study with, not only Hispanic marble quarry samples but also with those from the most important quarries in the Mediterranean area. One of the main problems in the study of white marble is the similarity of their visual appearance, however in impure white marbles the presence of any peculiar feature, even the odor when are broken, can help in their identification. The microscopic description paid special attention to the mineral composition, texture, fabric, maximum grain size (MGS) and grain boundary shape (GBS). Complementary, CL provides a better resolution on the marble provenance studies. The combination of both, petrography and CL, has been success-

8. Among others: Mielsch 1985; Gnoli 1988; Borghini 1992; Dubarry de Lassale 2000; Àlvarez *et al.* 2009.

9. The comparison was made with the *marmora* collections of the Área de Petrología y Geoquímica of the Universidad de Zaragoza (UZ), the Laboratory for the study of stone materials (LEMLA) of the Universitat Autònoma de Barcelona (UAB) and the Unitat d'estudis arqueomètrics (UEA) of the Institut Català d'Arqueologia Clàssica (ICAC).

10. Petrographic microscope OLYMPUS AX-70, of Departamento de Ciencias de la Tierra, Universidad de Zaragoza (Zaragoza).

11. Cathodoluminescence device CL8200 Mk5-1, coupled to petrographic microscope NIKON Eclipse 50iPOL of the Institut Català d'Arqueologia Clàssica-ICAC (Tarragona).

12. As can be seen in: Barbin *et al.* 1989, 1992.

Archaeological site	Object	Sample No.	Accessory minerals	MGS mm	GBS	Fabric	Type of fabric	CL fabric	CL intensity	$\delta^{18}O$ ‰	$\delta^{13}C$ ‰	Probable provenance
Los Bañales	Moulding	1	Qtz (–) / Ms (–)	0.6	CV/ST	HO	Polygonal mosaic	HO	Medium	–1.56	1.96	Carrara (Italy)
	Slab	2	Qtz (±) / Ms (–)	2.9	CV/SU	HE	Interlocked mosaic	HO	Faint	–1.70	2.86	Saint-Béat (France)
	Slab	3	Qtz (±) / Ms (–)	4.0	CV/SU	HE	Mosaic / Mortar	HO	Medium	–1.80	3.13	Saint-Béat (France)
	Slab	4	Qtz (±) / Ms (–)	3.5	CV/SU	HE	Mosaic / Mortar	HO	Medium	–2.96	4.18	Saint-Béat (France)
	Slab	5	–	0.5	SU	HO	Interlocked mosaic	HO	Strong	–	–	Pyrenean unspecified
	Toga	6	–	1.5	CV/EN	HE	Mosaic	HO	Very faint	–	–	Paros?
	Arm	7	–	1.8	CV/EN	HE	Mosaic	HO	Very faint	–	–	Paros?
	Right hand	8	–	1.4	CV/EN	HE	Mosaic	HO	Very faint	–	–	Paros?
	Slab	9	Qtz (±) / Ms (–)	2.6	CV/EN/SU	HE	Interlocked mosaic	HO	Faint	–1.65	4.05	Saint-Béat (France)
Campo Real	Column shaft	10	Op (–)	0.9	CV/EN/SU	HE	Lineated	HE	Strong	–4.57	-0.86	Docimium (Turkey)
	Column shaft	11	Op (±)	0.7	CV/EN/SU	HE	Mosaic slight lineated	HE	Strong	–4.57	-0.15	Docimium (Turkey)
	Cornucopia	12	-	2.0	CV/EN	HE	Mosaic	HO	Very faint	–3.46	1.86	Paros (Greece)
Cabezo Ladrero	Inscription	13	-	1.0	SU	HO	Interlocked mosaic	HO	Strong	–1.80	2.07	Pyrenean unspacified

Fig. 3 Data table with the results of the analysis performed in the Roman artifacts studied from the Cinco Villas territory. Accesory minerals: Qtz (quartz), Ms (muscovite), Op (opaque minerals). GBS: ST (straight), CV (curved), EM (embayed), SU (sutured). Fabric: HO (homeoblastic), HE (heteroblastic). CL: HO (homogeneous), HE (heterogeneous).

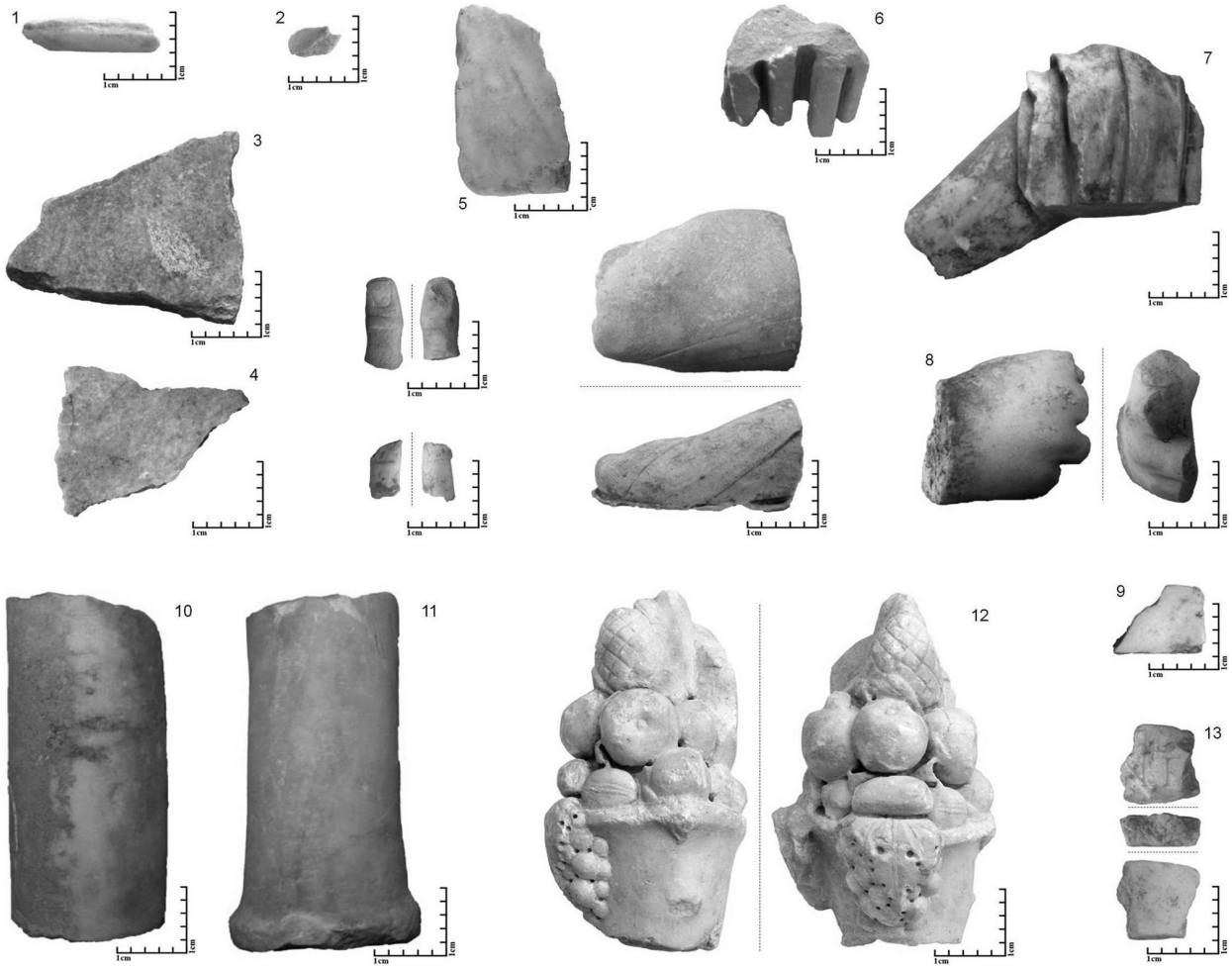

Fig. 4. Archaeological artifacts sampled from Cinco Villas. Los Bañales: nos. 1 to 9. Campo Real: nos. 10, 11 and 12. Cabezo Ladrero: no. 13.

fully applied to various areas of classical quarries[13] and is particularly useful when overlapping isotopic ratios of different quarries (LAPUENTE *et al.* 2012a). Several authors (MOENS *et al.* 1992; GORGONI *et al.* 2002; ATTANASIO *et al.* 2006, LAPUENTE *et al.* 2000) have developed a set of databases that compile the relative abundances of the ^{13}C and ^{18}O isotopes from the most important marbles used in antiquity.

A short description of the white marble artifacts found in Cinco Villas with their inventory numbers and data obtained from the different analysis have been sorted in a table (Fig. 3), with the marble source inferred from the combination of results. The visual aspect of the artifacts under study is shown in Figure 4.

To facilitate the comparisons, photomicrographs were taken under crossed polarized light (Fig. 5, on the left). The CL-patterns with a particular intensity and distribution of the photon emissions in the carbonate minerals were also photographically registered (Fig. 5, on the right).

The isotope marble quarry databases allow the comparison with those values of the analyzed archaeological samples (Fig. 6). The results are expressed in terms of ^{13}C and ^{18}O, in ‰ relative to the international reference standard PDB (Pee Dee Belemnite) (MCCREA 1950).

MARBLE PROVENANCE

In los Bañales, the varieties of *marmora* attested are quite diverse, as was usual on the *sectile* pavements. From the French Pyrenees, Campan (Green and Mixed) along with different varieties of Saint-Béat marbles were recognized in samples nos. 2, 3, 4 and 9, probably in the slab fragment (no. 5) and in the inscription plate of Cabezo Ladrero (no. 11), whose specific marble

13. Isotopic ratio mass spectrometer-IRMS FINIGAN MAT 252, of the Dipartimento di Scienze della Terra dell'Università "La Sapienza" (Roma).

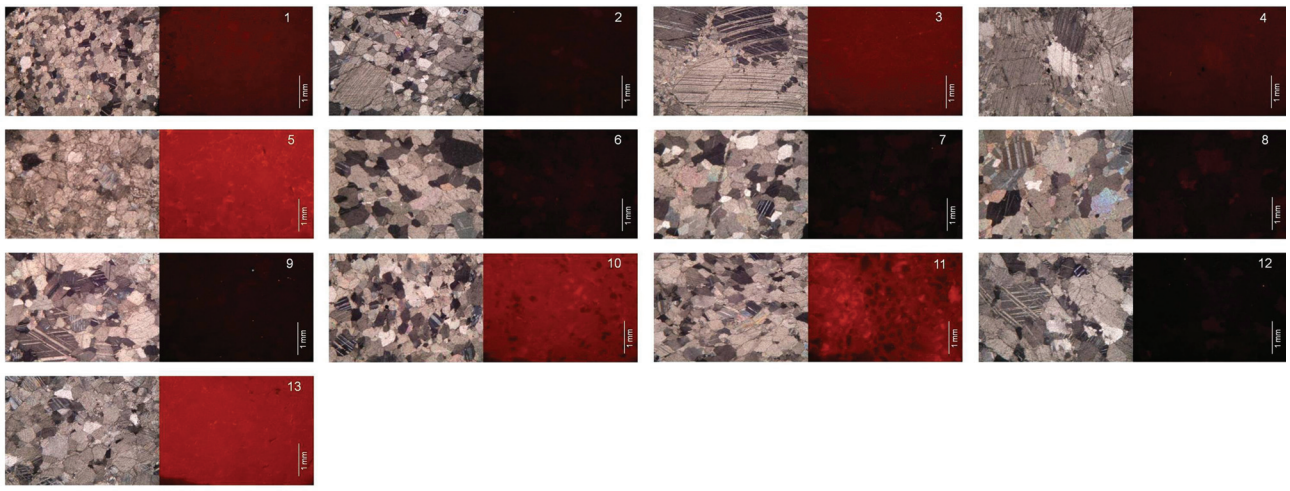

Fig. 5. Photomicrographs of the white calcitic marble samples analyzed, under cross polarized light on the left, and CL on the right.

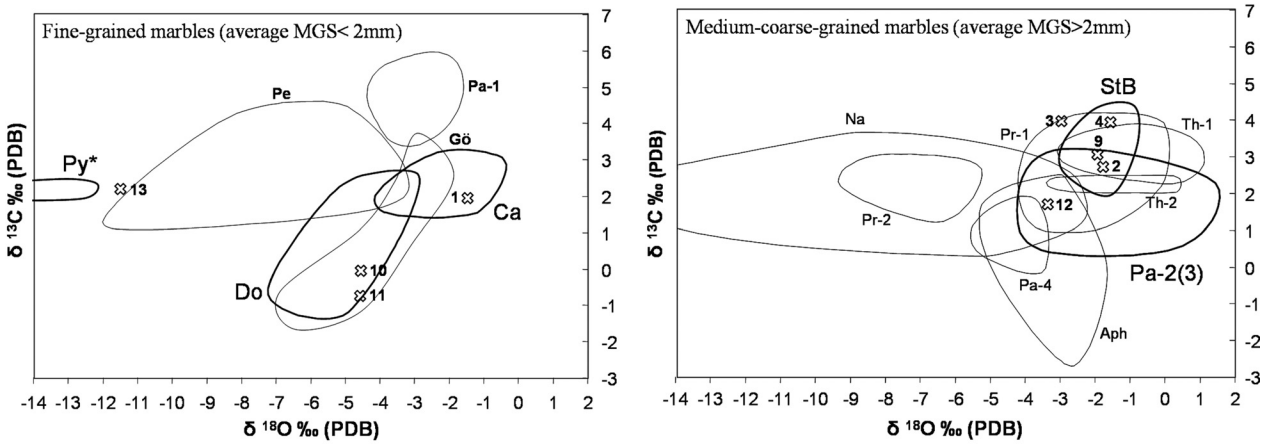

Fig. 6. Isotopic graphs with the distribution fields of the Classical white marble according to similar, MGS < 2mm and MGS > 2mm, respectively (Gorgoni *et al.* 2002; Attanasio *et al.* 2009, 2013; Royo *et al.* in this volume). Carrara (Ca), Göktepe (Gö), Paros (Pa), Penteli (Pe), Docimium (Do), Proconnesos (Pr), Thasos (Tha), Naxos (Na), Aphrodisias (Aph), Saint-Béat (StB) and Pyrenean unspecified (Py*).

quarry provenance remains uncertain. Giallo Antico and Lumachella Orientale – from the North of Africa – and Rosso Antico, Verde Antico, Cipollino Verde and *marmor luculleum* (Andreu in press), complete the list of coloured stones. Regarding other Classical quarrying marble sources, Carrara has been detected in the moulding piece no. 1. It is not the first time that this Italian marble source has been recognized in archaeological pieces of this territory, since was already attested in the paleochristian sarcophagus of Castiliscar (Zaragoza), dated in the 4th century AD (Lapuente *et al.* 1996). The identification of those pieces of sculpture nos. 6, 7 and 8 – as the same type of fine-grained marble, very well crystallized, with high translucency and a very low cathodoluminescence – makes us doubt between statuary Carrara marble and *lychnites* Parian marble. To determine its origin is necessary, at least, a geochemical analysis and isotopic ratios of C and O which would corroborate the identification[14]. Even so, its Mediterranean origin is clear. Both types of marble considered are very common in the sculptures of the Roman Empire, leads us to think that were all parts of a Roman imperial statue probably dedicated to the imperial cult and erected with an alive emperor, as the *calliga* of one of the fragments evidences.

In the place of Campo Real, it is not surprised the identification of marble of the island of Paros in the *cornucopia* piece (no. 12), in accordance with its fine style and since there were attested more statuary pieces carved from this Classical quarry source. This Parian variety is originally from the Chorodaki valley in the southwest of Marathi locality. Along with these marble

14. The isotopic analysis of C and O to complete the identification of these fragments is being carried out at the laboratory of the *Istituto di Geologia Ambientale e Geoingenieria-IGAG (CNR)* in Rome (Italy).

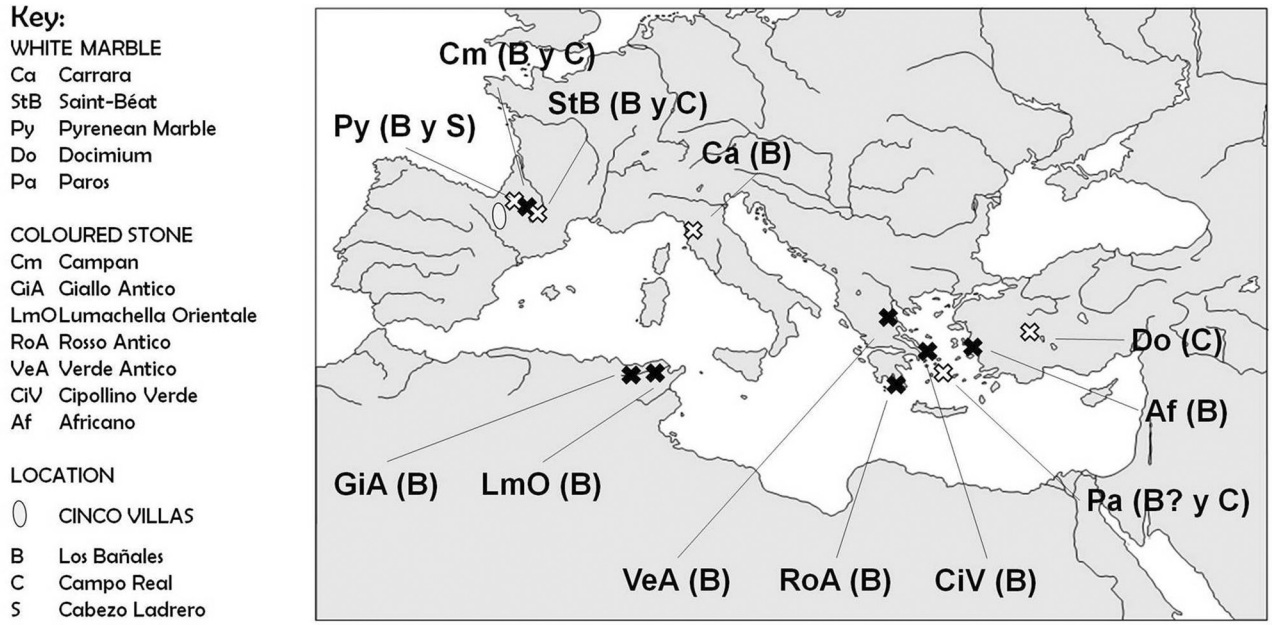

Fig. 7. Location map of the provenance quarries of the varieties mentioned in the text, along with the location of the studied area.

artifacts have been found two slabs fragments elaborated in Green Campan and Saint-Béat marble respectively. As well as the two small columns (samples nos. 10, 11) carved in white Docimium.

The piece no. 13 of the catalogue, though of uncertain Pyrenean origin, is also remarkable because not only is the first attestation of Roman marble in the *territorium* of Cabezo Ladrero, but also due to the epigraphic character of the piece, which could be part of a plate used in a burial. Until today, is the only epigraphic evidence in marble attested in the increasing epigraphic catalogue of this territory (JORDÁN 2009).

Conclusions

As usually occurs, the studied *marmora* fragments found in the Cinco Villas territory are of diverse provenance (Fig. 7). The number of pieces of colored *marmora* is sparse but exhibits a high diversity: Green Campan, Mixed Campan, Giallo Antico, Lumachella Orientale, Rosso Antico, Verde Antico, Cipollino Verde and *Luculleum*. In turn, their origin is diverse and in some cases remarkably exotic: Campan (France), Chemtou and Djebel Oust[15] (Tunisia), Cape Taenaro, Larisa and Euboea (Greece), and Teos (Turkey). It seems to have a jointly trade of Campan varieties and Saint-Béat marbles, directly distributed from the quarry areas, while the rest could be marketed through Rome. Despite a small number of pieces has been studied, they provide a better understanding of the prosperity of these archaeological sites, aspects that help to complete their socio-economic outlook.

The finding of a set of statuary fragments from the Forum of Los Bañales and a *cornucopia* from Campo Real elaborate on classical imported marbles confirm the importance of these Roman settlements which, until recently, have been considered as communities established in a marginal and secondary territory. It has been proved the use of Saint-Béat marbles in ornamental elements from Los Bañales and Campo Real, expanding its distribution map over the Roman *conventus Caesaraugustanus* where they had been widely recognized, in particular in the nearby Caesar Augusta Colony (LAPUENTE *et al.* 2009), especially for architectural and decorative purposes, epigraphy and sculpture.

The presence of *marmor* lunensis from Carrara in a moulding fragment of Los Bañales and Docimium marble in two column shafts of Campo Real highlights the rich decoration of certain rooms, for which were chosen especial imported noble material instead other options such as Saint-Béat marble which was relatively more accessible.

Currently, several Pyrenean marble outcrops[16] are being studied to better know their discriminate fingerprints and to determine the specific origin of different artifacts found in Cinco Villas – as slab fragment from Los Bañales or inscription fron Cabezo Ladrero – whose chemical and physical characteristics do not match any other well known marble source, but probably were carved in Pyrenean marble.

15. In Lazzarini and Mariottini 2012, 446 justified the change of provenance of this variety of lumachella which traditionally had been assigned a provenance from Henchir el-Kasbat.

16. Diverse Pyrenean marble outcrops are being studied as part of the PhD Thesis being carried out by H. Royo, one of the authors of this paper.

All the imported *marmora* and white marbles here recognized, had also been attested in the colony of Caesar Augusta and many of them in the nearby territory of Alto Aragon (LAPUENTE *et al.* in this volume). The evidence reported in this study, along with more recent testimonies found in other local Roman cities like Pompelo or Santacrís, provide a better perspective of this territory, which shares the ornamental and sculptural habits attested in other emplacements of the Ebro valley, following the Roman taste widely distributed around the Empire.

Acknowledgments

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