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LOCAL STONES AND MARBLES FOUND IN THE TERRITORY OF "ALTO ARAGON" (HISPANIA), IN ROMAN TIMES

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Abstract

The territory of "Alto Aragon" closely matches the current province of Huesca in the northeast of Spain. Its geographic location between the Pyrenean range and the Ebro basin, offers a wide variety of stone as raw materials. After the area came under Roman rule, around 200 BC, several Roman cities and villas were established in the territory. Local sandstone and limestone were used for buildings and pedestals. Limestone from several other locations, including Santa Tecla quarry (Tarraco) was used as marmora. A small sculpture carved from Giallo antico, has also been found in excavations of ancient Osca.

For reasons unknown, local marble outcrops from the Spanish central Pyrenees were not exploited during Roman times. However a small but significant, number of archaeological pieces, mostly of white marble, were found. A combination of archaeometric techniques has been used to determine the source of the raw materials: optical microscopy, cathodoluminescence, carbon and oxygen stable isotopes. A number of pieces were carved from French Pyrenean marbles and from the Classical quarrying areas of Luni-Carrara, Paros, Proconnesos and Pentelikon.

Keywords

Marble provenance, Roman Pyrenean quarries, Roman artefacts, Huesca province

Archaeological and historical background

The territory of "Alto Aragón" is an inland area with diverse topography, climate and geologic environments located between the hilly slopes of the south side of the Central Pyrenees and the semiarid plains of the Ebro Valley. Today it is mostly comprised by the Spanish province of Huesca (Fig. 1). The area was settled by Iberian inhabitants before the Roman legions disembarked at *Emporion* in 218 BC. It is known that nearly 200 years of continuous military campaigns were needed to the total conquest of Iberia. But this territory was early under Roman control and in 197 BC was part of the province of *Hispania Citerior.* The presence of Italian pottery in different archaeological remains along the Ebro Valley evidences that Roman trading preceded the military dominion. Black varnished Campanian tableware pottery and Italian amphorae for food transport, are found in many scattered Iberian places. The Roman culture arrived to the area along with the Roman goods. At the beginning of the 1st century BC, there were no major changes in the population's distribution. The Iberian city of *Bolskan* (latinized as *Osca*, modern Huesca) maintained its dominance thanks to its privileged location surrounded by a network of smaller towns, also heirs of indigenous settlements such as current Bolea and *Bourtina* (Almudévar) (JUSTE 2000, 92). The area had an important scene for two political fights originated in the *Urbs*: The Sertorian war (80-72 BC) and the Civil war (49-46 BC). By 77 BC, Quintus Sertorius had won over most of *Citerior* to his cause and established the capital at *Urbs Victrix Osca*. The city minted its own coinage and was the site of a prestigious school founded by Sertorius to educate young Iberians in Latin and *Romanitas*. But the Romanization of the territory would not have been possible without the political, economic and urban reorganization introduced by the newcomers who integrated this territory to the *Hispania Citerior* province. During the next centuries, the economic expansion and the increase of population along the High Empire give birth of new cities and the expansion of existing ones, such as *Labitolosa* (near La Puebla de Castro) (MAGALLÓN *et al.* 1995, 125), *Iakka* (Jaca) (ROYO 2004, 69-71), among others.

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Fig. 1. Geographic setting of the "Alto Aragón" territory and the location of Roman cities, villas and isolated finds cited in the text.

By Augustan period, the Roman culture was clearly predominant in the "Alto Aragón" territory and scarce vessels, inherited of the indigenous tradition, survived. By this time, the urban life, a phenomenon, previously unknown in this territory, was developed. An important number of emplacements were settled in the countryside, either of large size (villas) or small ones (farms). Most of the territory suitable for cultivation near to ways of communication was splashed by these establishments. They were essentially farms with large storage rooms and few residential buildings furnished and decorated with *marmora* following the Roman luxury taste. Thus, marble sculptures have entered the area as evidenced at Sabiñánigo, Nocito, Benasque and in the main city, *Osca*, where marble was used for major public buildings.

After several centuries of economic splendour, cultural wealth and population growth, the urban population reduced drastically and many settlements were abandoned. Only very few survived as the settlements of *Villa Fortunatus* (Fraga) (MONTÓN 2004, 88) and Monte Cillas (Coscojuela de Fantova) (NAVARRO *et al.* 2000, 252). The large villas were abandoned and the population gathered in the rare surviving cities, as *Osca* and the nearly *Caesar Augusta* (current, Zaragoza), or was hidden in isolated territories.

Geological setting

The "Alto Aragon" territory is located between the Ebro valley and the Central Pyrenees (SOLE-SABARIS, 1951). This large region has a varied lithology, from Paleozoic to Neogene ages. Its southern area forms part of the Cenozoic sedimentary record of the Ebro basin, composes of coarse to fine alluvial deposits and lacustrine facies. From the north to the south, different sedimentary materials occur, such as conglomerates, sandstones, siltstones, mudstones, gypsum and limestones. Miocene continental deposits and Pliocene unconformaly overlie Paleogene sediments in this zone. The northern area constitutes the Central Pyrenees which has a complex structure with a Mesozoic-Eocene sedimentary sequence detached from the Axial Zone or basement of metamorphic Precambrian and Paleozoic rocks intruded by Variscan granitoids. Close to the French border, in the Devonian carbonate sequence around the epizonal granitoid masses, is where marbles and calc-silicate rocks occur. There is no evidence of having being exploited these metamorphic materials in Roman times. Conversely, sedimentary stones have been extensively used at that time, especially those outcrops located near the human emplacements.

Archaeometric study

Diverse archaeological lithic material has been found in Roman cities and villas set up in this territory. The artefacts under study have been found in cities such as *Osca* (Huesca), Labitolosa (near Puebla de Castro), *Iakka* (Jaca), and Monte Cillas (near Coscojuela de Fantova), *villae* as *Villa Fortunatus* (near Fraga), or isolated

Location	No.	Sample	Archaeological Artefact	Chronology	Stone type	Stone identification
Osca	**1**	79-HU	Ashlar	-	Sandstone	Miocene sandstone
	2	-	Pedestal with inscription	1st AD	Limestone	Eocene alveoline limestone
	3	41-HU	Pedestal with inscription	2nd AD	Limestone	Eocene alveoline limestone
	4	-	5 large tesserae	-	Limestone	Eocene alveoline limestone
	5	-	Slab frag. with moulding	-	Crystalline limestone	Santa Tecla
	6	-	Slab fragment	-	Brecciated limestone	Campan rouge
	7	-	Slab fragment	-	Brecciated limestone	Giallo antico
	8	-	Slab fragment	-	Brecciated limestone	Giallo antico
	9	-	Hermes bust	1st BC/1st AD	Limestone	Giallo antico
	10	3-HU	Slab fragment	1st-2nd AD?	Crystalline limestone	Fior di pesco
	11	4-HU	2 slab fragments	-	White marble	Carrara
	12	5-HU	2 vessel fragments	-	White marble	Carrara
	13	15-HU	Small column	-	White marble	Carrara
	14	68-HU	Slab fragment	-	White marble	Carrara
	15	75-HU	Slab fragment	-	White marble	Carrara
	16	77-HU	Moulding fragment	-	White marble	Carrara
	17	72-HU	Slab fragment	-	Banded marble	Banded Saint-Béat
	18	-	Slab fragment	-	Banded marble	Banded Saint-Béat
	19	-	Slab fragment	-	Banded marble	Banded Saint-Béat
	20	-	Slab fragment	-	Banded marble	Banded Saint-Béat
	21	1-HU	Human statue (foot)	-	White marble	Paros-1
	22	2-HU	Paw of lion	End 1st AD?	White marble	Paros-1
	23	32-HU	King Ramiro II sarcophagus	End 3rd AD	White marble	Proconnesos
Monte Cillas	**24**	8-COS	Slab fragment	-	Limestone	Triassic micritic limestone
	25	1-BRB	Pedestal with inscription	-	Limestone	Eocene alveoline limestone
	26	1-COS	Pedestal without inscription	-	Limestone	Eocene alveoline limestone
	27	2-COS	Pedestal with inscription	-	Limestone	Eocene alveoline limestone
	28	2-BRB	Pedestal with inscription	-	Limestone	Paleocene lacustrine limestone
	29	3-COS	Pedestal with inscription	-	Limestone	Paleocene lacustrine limestone
	30	4-COS	Pedestal with inscription	-	Limestone	Paleocene lacustrine limestone
	31	5-COS	Pedestal with inscription	-	Limestone	Paleocene lacustrine limestone
	32	-	Column shaft reused	6th–8th AD	Brecciated limestone	Campan vert
	33	7-COS	Slab fragment	-	White marble	Carrara
	34	6-COS	Slab fragment	-	White marble	Banded Saint-Béat
Labitolosa	**35**	9-HU	Moulding	-	Limestone	Eocene alveoline limestone
	36	-	Moulding fragment	-	Limestone	Eocene alveoline limestone
	37	6-HU	6 moulding fragments	-	Crystalline limestone	Santa Tecla
	38	7-HU	2 funerary inscription frags.	-	Limestone	Santa Tecla
	39	11-HU	Moulding fragment	-	Crystalline limestone	Santa Tecla
	40	12-HU	Slab fragment	-	Crystalline limestone	Santa Tecla
	41	-	3 moulding fragments	-	Crystalline limestone	Santa Tecla
	42	-	Moulding fragment	-	Crystalline limestone	Santa Tecla
	43	-	Moulding fragment	-	Crystalline limestone	Santa Tecla
	44	-	2 slab fragments	-	Limestone	Santa Tecla
	45	10-HU	Slab fragment	-	White marble	Carrara
	46	18-HU	Moulding	-	White marble	Carrara
	47	13-HU	Funerary inscription	1st-2nd AD	White marble	Carrara
	48	8-HU	Funerary inscription frag	-	Grey marble	Carrara Bardiglio

Fig. 2. Studied Roman artefacts with typology, localization of the findings, chronology when is known, general lithotype and stone provenance.

Location	No.	Sample	Archaeological Artefact	Chronology	Stone type	Stone identification
Villa Fortunatus	**49**	1-VF	Pedestal with inscription	-	Limestone	Oligocene lacustrine limestone
	50	2-VF	Inscription	-	Limestone	Oligocene lacustrine limestone
	51	3-VF	Capital	-	Limestone	Oligocene lacustrine limestone
	52	4-VF	Base	-	Limestone	Oligocene lacustrine limestone
	53	5-VF	Altar-Ara	-	Limestone	Oligocene lacustrine limestone
	54	6-VF	Oil millstone or fountain	-	Limestone	Oligocene lacustrine limestone
	55	8-VF	Ashlar	-	Limestone	Oligocene lacustrine limestone
	56	10-VF	Tesserae	-	Limestone	Oligocene lacustrine limestone
	57	9-VF	Tesserae	-	White marble	Carrara
	58	17-HU	Atis statue	4th AD	White marble	Carrara
	59	62-HU	Dolphin statue	4th AD	White marble	Paros-2
Sabiñánigo	**60**	14-HU	Funerary inscription	1st-2nd AD	White marble	Carrara
Siresa	**61**	1-SRS	Inscription	End 4th AD	White marble	Carrara
Nocito	**62**	16-HU	Male head	2nd AD	White marble	Saint-Béat
	63	52-HU	Male head	1st-3rd AD	White marble	Penteli
	64	53-HU	Male head	1st AD	White marble	Paros-1
Bolea	**65**	61-HU	Reclined female statue	-	White marble	Paros-1
Llert	**66**	1-LL	Ara with inscription	-	White marble	Saint-Béat
	67	2-LL	Ara without inscription	-	White marble	Saint-Béat
Hospital de Benasque	**68**	60-HU	Ara	-	White marble	Saint-Béat
	69	66-HU	Ara	-	White marble	Saint-Béat

Fig. 2. (*segue*)

findings as Nocito, Sabiñanigo, Bolea, Siresa, Benasque and Llert. Most of them are currently exhibited at the Archaeological Museum of Huesca, but also pieces from the Diocesan Museums of Huesca and Barbastro were studied. A serie of pedestals with inscription are imbedded on the exterior wall of a small church in Monte Cillas. 69 archaeological elements, displayed on fig. 2, were examined and sampled to perform the archaeometric study.

Optical microscopy together with cathodoluminiscence (CL) analyses were applied systematically to complement the macroscopic features. In most of the coloured stones, macroscopic observation was sufficient to identify the provenance. However, since certain *marmora* look similar, their examination under the optical microscope helped their identification. The study of white marbles requires a multi-method approach. The petrographic parameters such as the maximum grain size (MGS) of carbonate crystals, the grain boundary shape (GBS), along with the identification of mineral components, texture and fabric are diagnostic for many marble sources (Lazzarini *et al.* 1980; Moens *et al.* 1988; Lapuente 1995; Lapuente and Turi 1995; Gorgoni *et al.* 2002). The method is improved with the CL observation[6] since especially carbonate has different textural variations with changes in colour, intensity and distribution on the CL pattern, in response to the impurity content. Mn^{2+} and REE in trace concentration are luminescent activators on carbonate, but Fe^{2+} inhibits the CL (Barbin *et al.* 1992; Lapuente *et al.* 2000; Lapuente and Blanc 2002). Photomicrographs under crossed polarized light (CP), and CL-pattern[7] facilitate the comparison with the available CL databases.

Additionally, measurements of the C and O isotope ratio present in carbonate were also required to determine the marble source (Moens *et al.* 1992; Lapuente *et al.* 2000; Gorgoni *et al.* 2002; Attanasio *et al.* 2006, 2013). They were carried out with an isotopic ratio mass spectrometer (IRMS)[8], after a suitable chemical treatment. Data are expressed in terms of usual delta notation, expressed as ^{13}C and ^{18}O, in parts per thousand (‰) relative to the international standard, the Pee Dee Belemnite (PDB).

Results

Building stones of local origin

The local sedimentary rocks were widely used for

6. Using CL8200 Mk5-1 equipment coupled with a NIKON Eclipse 50iPOL optical microscope of the Institut Català d'Arqueologia Clàssica (ICAC), in Tarragona.

7. Photomicrographs were taken automatically with a COOLPIX5400 NIKON digital camera system coupled to the petrographic microscope eyepiece via an adapter Lens NIKON COOLPIX MDC. The CL images (29mm focal length, f/4.6 aperture, 1s exposure, ISO-200) facilitate the comparison with different lithotypes.

8. The analyses were carried out at the Laboratory of Isotopes, Dipartimento di Scienze Stabili the della Terra, University "La Sapienza" of Rome, with Finnigan MAT 252 equipment.

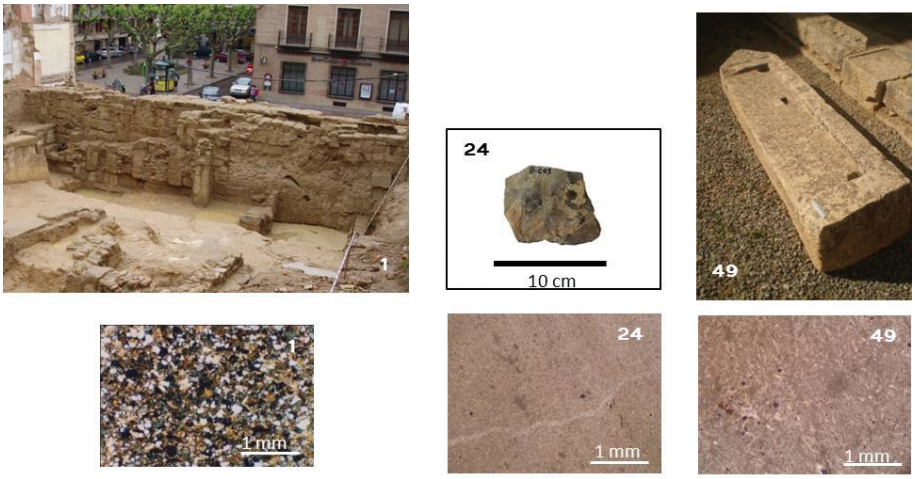

Fig. 3. Photomicrograph (CP) and visual aspects of local stone lithotypes identified and used in Roman times. No. **1**: Miocene sandstone in the Roman wall of *Osca*; No. **24**: Triassic micritic limestone, Muschelkalk facies, in a slab fragment; No. **49**: Oligocene lacustrine limestone in an inscription reused as a threshold.

building stones and architectural decorative elements. The study of these materials is based on the petrographic analyses, macroscopic and microscopic ones which were compared to the respective analyses on reference samples taken in outcrops near archaeological sites and ancient quarries with uncertain chronology. Fig. 3 shows a selection of photomicrographs of the archaeological elements.

Three different lihotypes were identified:

- Lithotype 1: Miocene sandstone (Aquitanian-Burdigalian): Light brown stone with fine-medium grain, classified as calcareous lithoarenite (PETTIJOHN *et al.* 1987). Texture is sustained by grains with homogeneous granulometric composition including mainly angular quartz and feldspar clasts with carbonate rock fragments. Detrital biotite, muscovite and opaque minerals are minor components but characteristics (sample no.**1**).
- Lithotype 2: Triassic limestone (Muschelkalk): Grey micritic stone with small calcite-filled veins, well cemented, classified as biomicrite limestone (FOLK 1962) or wackestone (DUNHAM 1962; EMBRY and KLOVAN 1971). Texture sustained by the matrix with about 20% of bioclasts, corresponding to fragments of fine bivalve shells (sample no. **24**).
- Lithotype 3: Oligocene lacustrine limestone (Stampian): Grey stone slightly dusty, classified as biomicrite (FOLK 1962) or wackestone (DUNHAM 1962; EMBRY and KLOVAN 1971) Texture sustained by the matrix with about 20% of highly fragmented and dissolved bioclasts (samples nos. **49, 50, 51, 52, 53, 54, 55, 56**).

Ornamental local stones

Two local Paleogene limestones were used for ornamental purposes in Roman times (Fig. 4). One is a typical Ilerdian marine sediment (Eocene) easily recognizable by the microforaminifera content, and the second is a continental Paleocene one, probably in Garumnian facies. Both form part of a carbonate sequence where lacustrine facies is interbedded on the bottom of the serie.

- Lithotype 1: Eocene yellowish to whitish marine limestone with microfossils. It is well cemented, grainstone (DUNHAM 1962), biosparrudite (FOLK 1962) or rudstone (EMBRY and KLOVAN 1971), texture sustained by the grains with more than 50% of allochemical components corresponding to alveolines, miliolids (*Quinqueloculine*) nummulitids, other foraminifera, crinoids plates and bivalve shells. Porosity filled by microspar calcite cement. Eight samples were identified (nos. **2, 3, 4, 25, 26, 27, 35, 36**).
- Lithotype 2: Paleocene greyish ochre lacustrine limestone, classified as wackestone (DUNHAM, 1962) or pelmicrite limestone (FOLK, 1962). It is somewhat recrystallized with pseudospar matrix between grains, texture sustained by the matrix with no more than 15% of allochemical components, mainly voids thalli of charophytes algae and small peloids. Presents up to 15% open porosity and a thin fracture filled by microsparitic cement. Four samples were assigned to this variety (nos. **28, 29, 30, 31**).

Paleogene outcrops are located along the Pyrenean Border Ranges (External Sierras). Ancient quarries have not been discovered, but there are several modern ones in the area.

Imported coloured stones

Several imported coloured stones have been found in Roman archaeological context in the "Alto Aragón". Their macroscopic features and petrographic examination allowed distinguishing the following varieties, shown in Fig. 5:

- Santa Tecla stone: It is the most profuse *marmora* found with 9 samples (nos. **5, 37, 38, 39, 40, 41, 42,**

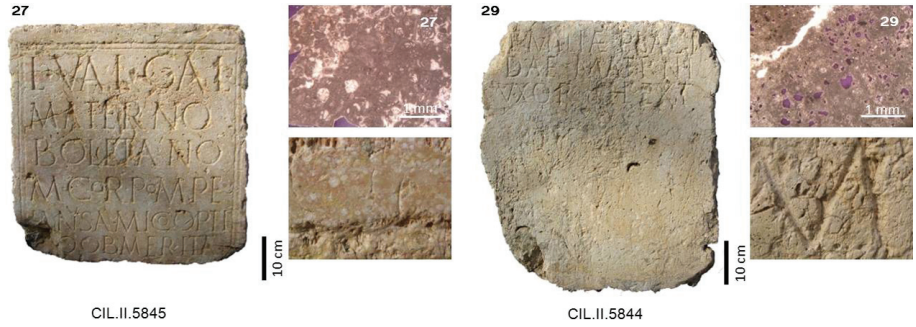

Fig. 4. Photomicrographs (CP) and visual aspect (general and detailed) of ornamental local lithotypes used in Roman times. No. **27**: Eocene marine limestone with microfossils, in a pedestal with inscription; no. **29**: Paleocene lacustrine limestone in a pedestal with inscription.

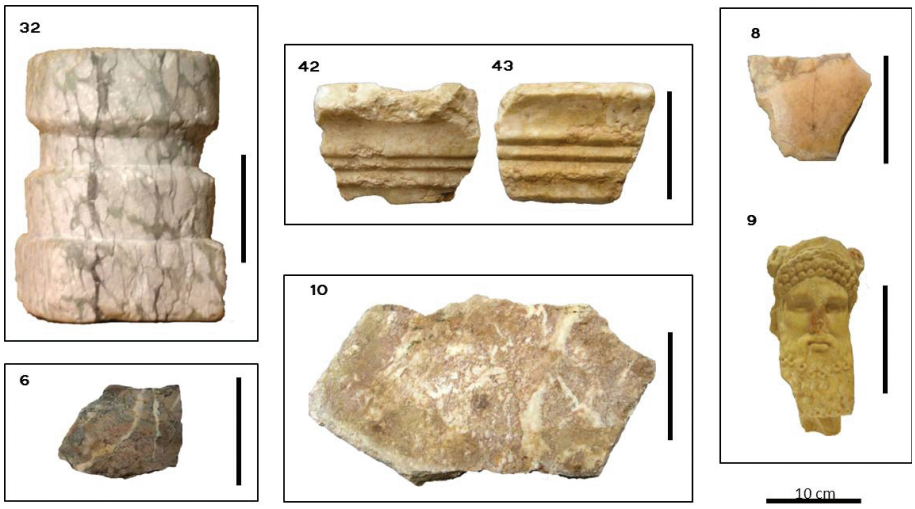

Fig. 5: Selection of archaeological elements in different coloured stones found in the "Alto Aragón" territory. Nos. **42** and **43**: Santa Tecla Stone in two moulding fragments. No. **6** Cipollino mandolato rosso in a slab fragment. No. **32** Cipollino mandolato in a reworked capital. Nos. **8** and **9** Giallo antico in a slab fragment and a Hermes head, respectively. No. **10** Fior di pesco in a slab fragment.

43, 44). This Cenomanian crystalline limestone outcrops near the Roman city of Tarraco (ÀLVAREZ *et al.* 2009).

- Cipollino mandolato rosso/Campan rouge (sample **no. 6**) and Cipollino mandolato /Campan vert (sample no. **32**) from Campan village in the French region of Midi-Pyrenees.
- Giallo antico/*marmor numidicum* (samples no. **7, 8, 9**) from Chemtou near the ancient Roman city of *Simitthus*, in Tunisia.
- Fior di Pesco or *marmor chalcidicum* (sample no. **10**) from Eretria on the Greek island of Euboea.

Imported white marbles

A rather modest but interesting number of imported white marbles have been identified. Their petrographic compositional, granulometric and textural parameters, as well as CL features are shown in the selected photomicrographs of fig. 6. Their marble source was determined by the combination of petrographic-CL characteristics with the results of the stable C and O isotope signatures (Fig. 7) plotted on their respective diagrams[9].

A selection of the studied white marble artefacts is shown in fig. 8.

- A significant number of pieces, fourteen samples (nos. **11, 12, 13, 14, 15, 16, 33, 45, 46, 47, 57, 58, 60, 61**) were carved from white Carrara marble and one sample (no. 4**8**) from Carrara bardiglio variety. They are calcitic marbles with homogeneous fine grain size and a MGS less than 1.1 mm. The granoblastic polygonal texture has mainly straight GBS, without signs of deformation. Accessory isolated small opaque minerals and microdolomite are not excluded in sample no. 48. CL-pattern shows a homogeneous medium-faint luminescence. It presents high ^{13}C value (from 1.95 to 2.29‰) and low ^{18}O value (from -2.53 to -2.01‰) compatible with the isotopic signature of Carrara marble, as fig. 7 shows.
- Five samples (nos. **62, 66, 67, 68, 69**) were recognized as white Saint-Béat marble and other five samples (nos. **17, 18, 19, 20, 34**) as banded Saint-Béat marble from quarries located in the French Haute-Garonne region of Midi-Pyrenees. Both, white and grey/white banded calcitic marbles present similar petrographic features and general isotopic signature. They are heterogeneous medium-coarse grained marbles, with a MGS of 2.8 mm in length, and ex-

9. Modified from Gorgoni *et al.* (2002) with data of Attanasio *et al.* (2013) Costédoat (1995) and Royo *et al.* (in this volume).

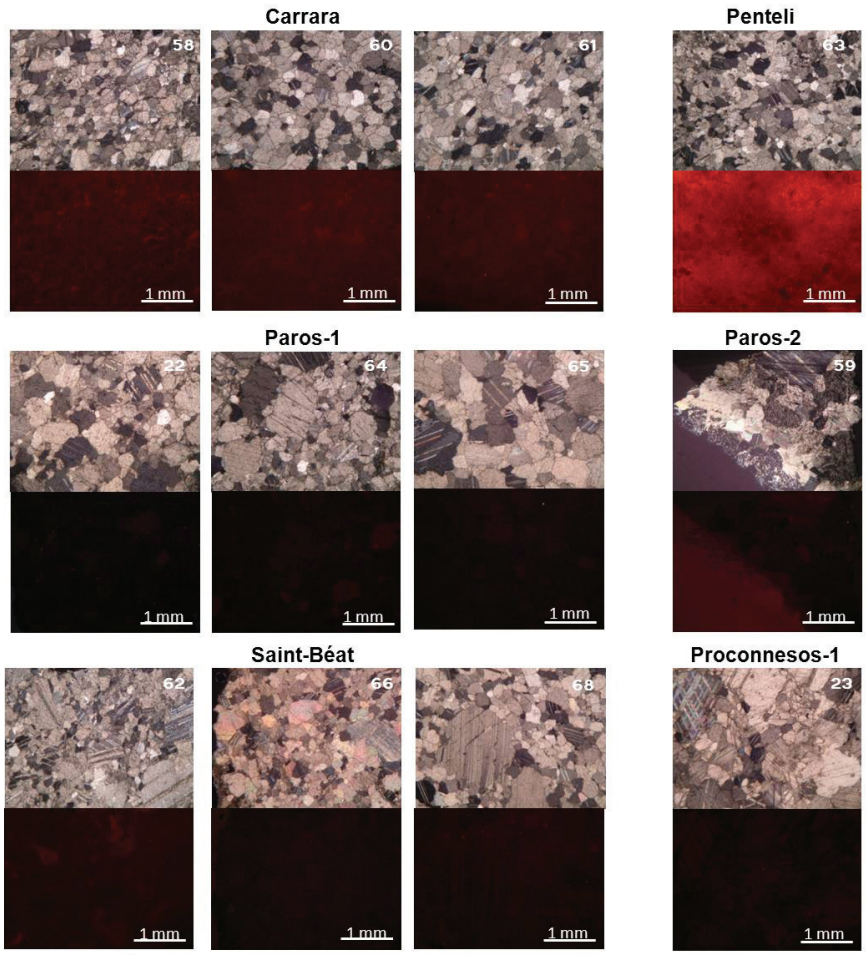

Fig. 6. Selection of representative photomicrographs with petrographic features under cross-polarized light (up row) and CL-patterns (down row) of white Roman archaeological marbles found in the "Alto Aragón".

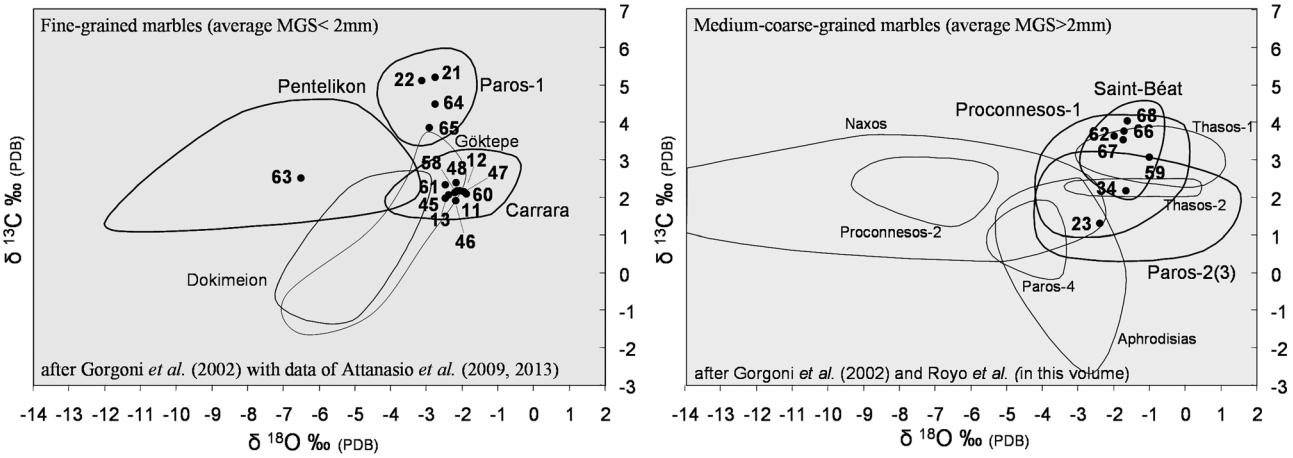

Fig. 7: Isotopic signature of Roman white marbles found in the "Alto Aragón".

ceptionally gray banding sample (no. 34) shows a 6.5 mm isolated crystal. They exhibit a heteroblastic texture with curved or indented GBS, scarce signs of intracrystalline deformation and presence of small accessory opaque minerals. CL displays faint and homogeneous intensity, though some crystals with few impurities have slightly stronger intensity variations. Their isotopic signature has a high ^{13}C value (ranging from 2.17 to 4.01‰) and a low ^{18}O value (from -2.03 to -1.64‰). Isotopic data have been plotted on the respective isotopic diagram of the Classical coarse grained marbles, where also the Saint Béat signature has been incorporated, based on the available data from literature (Costedoat 1995, Royo *et al.* in this volume). Contrasting with the isotopic cluster, the archaeological pieces are compatible

Fig. 8. Selection of Roman artifacts found in the "Alto Aragón" carved from imported white marbles. Carrara (two inscriptions nos. **60** and **61**, and a sculpture of Atis no. **58**), Paros-1 (a lion's leg no. **22**, a male head no. **64** and a sculpture of reclining woman no. **65**), Paros-2 (a sculpture of dolphin ridden by Eros no. **59**), Penteli (a male head no. **63**) and Saint-Béat (a male head no. **62** and two incomplete small altars nos. **66** and **68**).

with the isotopic fields of Thasos-1, Proconnesos-1 and Saint-Béat, but fabric and CL are only compatible with the French Pyrenean marble, confirming this origin (Fig. 7).

- One portrait (sample no. **63**) was assigned to Pentelic marble. It is a calcitic white marble with fine and heterogeneous grain size, MGS is around 1.0 mm in length, GBS is mainly embayed, without signs of intracrystalline deformation. It presents dolomite in small crystalline aggregates, muscovite and small opaque minerals as accessory minerals. Its CL is heterogeneous with medium to strong luminiscence and patched variations to faint intensity, associated with larger crystals. The isotopic signature has a ^{13}C value of 2.54‰ and a very low ^{18}O value of -6.55‰, compatible with Pentelic marble.

- Five samples were recognized as marbles from the Paros Island. Four of them were assigned to Paros-1/lychnites (nos. **21, 22, 64, 65**), characterized by a pure white calcitic marble with granoblastic and heteroblastic texture, and fine grain size with MGS of 1.6 mm. Mainly curved GBS, without signs of deformation. They have a homogenous and extremely low CL and a diagnostic very high ^{13}C value (ranging from 3.82 to 5.19‰) with low ^{18}O value (from -3.17 to -2.80‰) compatible with Paros-1 isotopic field. Additionally, sample no. **59** was assigned to the Paros-2 variety. It is also calcitic white marble with high translucency, unfortunately the small chip sample is not representative to measure the MGS, but its heteroblastic texture along with its faint CL-pattern allowed assigning them to a Paros-2 marble source. The isotopic signature with ^{13}C value (3.05‰) and

low ^{18}O value (-1.09‰) is compatible with this origin.

- Finally, the sarcophagus known today as the tomb of King Ramiro II of Aragon (no. **23)** should be included in the list of the marble artefacts found in this territory. As it was reported in a previous paper (LAPUENTE *et al.* 2012), the archaeometric results proved the use of Proconnesian marble.

The uses of local rocks and imported marbles

Between the 2nd century BC and the 6th century AD, the influence of Roman culture in the "Alto Aragon" territory, developed not only a number of public and private infrastructures, but also the trade of diverse items of luxury, ritual or everyday use. For building and functional structures, which demanded a huge amount of raw material, local soft Miocene sandstones were used. But for special functions, either religious, funerary or memorial, high quality and appreciated marbles were imported from around the Mediterranean region and also from the nearest marble quarry district of Saint-Béat in the French Pyrenees.

In the Roman city of *Osca*, the exploitation of local material is strongly emphasized. Continental Miocene sandstone was extensively used for building elements, mainly large blocks or ashlars, in both public and private constructions. The stone was available to the extraction in the surroundings, not farther than 10-15 km. The location of quarries from the Roman period is so far not evidenced, though remains of use of stone are still visible in many places, yet could be attributed to medieval times as well. Places such as Las Mártires, Pebredo, Fornillos, Tierz, Monflorite, Montearagón, Ayera Puiyéqueda or Monzú are examples of localities closed to the current Huesca city, where small quarry fronts and/or extraction traces have been preserved. In many cases, the combination of natural erosion and its peculiar isolated sandstone deposits in lenticular paleochannels, have facilitated their total extraction.

A similar pattern is found in other Roman cities such as Labitolosa or Monte Cillas, where local limestone of Muschelkalk facies was used for common constructions. In the case of the building material of *Villa Fortunatus*, extensive extraction of local Oligocene limestone was required. However, in both stones the dimension of the blocks was determined by the bedding space, which does not allow the quarrying of large blocks. Local *marmora* like the Eocene limestones were used for the *laudae* of *Osca* and Monte Cillas and for architectural elements in Labitolosa.

Sumptuary objects such as statues and commemorative or funeral inscriptions were carved from imported marbles. Concerning the varieties recognized, apart from French Pyrenean marbles, a number of appreciated white marbles were imported from Luni-Carrara, Paros, Pentelikon and Proconnesos. Among the coloured stones, it is worthy to mention the use of Santa Tecla stone from *Tarraco*, for slabs and moulding fragments especially in Labitolosa. The distribution of this *marmora* along the Ebro valley had been attested in diverse Roman sites, as the Theatre of *Caesar Augusta* (LAPUENTE *et al.* 2009) but now is extending to the north and northeast *(Osca* and Labitolosa) outside the Ebro River evidencing a trade connection with the capital of the Roman province. Additionally, Giallo antico was the most remarkable *marmora* identified not only for pavements, but also in one small sculpture (Hermes head, No. 9 in table, Fig. 2 and Fig. 5:9).

In spite of having marble outcrops in this territory, they were not exploited during the Roman times. As many of the analyzed white marble artefacts were found without any archaeological context, it is difficult to understand when exactly they arrived, but in the 1st century AD, marble items were already widespread in the area. Fragments of statues such as a lion leg found in *Osca*, or the Bolea's lady and the funerary stele of Sabiñánigo are dated between the 1st and 2nd centuries AD.

During the Late Roman Empire, import of marble continued, as evidenced by the statues of *Villa Fortunatus* and the reused inscription plate of the San Pedro church of Siresa..

Noteworthy is the presence of Saint-Béat marbles in this territory. This French Pyrenean marble district located near the frontier with Spain, about 200 km northeast of *Osca,* is situated on the other side of the Alpine mountain belt. However, it seems that it was not too difficult to pass through the area, even with heavy goods, since Saint-Béat marbles have been attested scattered on the north of this territory and also in the nearby Cinco Villas region (ANDREU *et al.* in this volume). Different varieties of marbles from Saint-Béat district, including the breccia known "La Pène St. Martin" or "Roman Breccia", were also attested in the Roman city of *Caesar Augusta* (70 km south of *Osca*) (LAPUENTE *et al.* 2009) and in other Roman emplacements along the Ebro River. Though little is known of the mechanics of marble distribution in this area, traditionally it has been thought that the marble trading was mainly benefited by the navigable course of the Ebro River. However the existence of archaeological pieces carved from Saint-Béat marbles throughout the "Alto Aragon" territory also points to the land routes of distribution with trading connections of both sides of the Pyrenees.

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