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Archaeology and archaeometry of marbles in Roman central Adriatic Italy

Devi Taelman[1], Dimitri Van Limbergen[2], Fabrizio Antonelli[3]

[1] *Department of Archaeology, Ghent University, Belgium*
[2] *Department of Archaeology, Ghent University, Belgium*
[3] *LAMA – Laboratory for Analysing Materials of Ancient Origin, IUAV University of Venice, Italy, fabrizio.antonelli@iuav.it*

***Abstract* – This contribution presents the results of an archaeological and archaeometric study of the provenance and use of marble in Roman central Adriatic Italy. During the Late Republic and Early Empire, the area was one of the most urbanised regions in the Roman world. Most towns were extensively equipped with monumental buildings, often lavishly decorated with imported marbles.**
Provenance determination of polychrome marbles was obtained through macroscopic examination; thin section petrography, X-ray diffraction and stable isotopic analysis ($\delta^{18}O$ and $\delta^{13}C$) for white marbles.
Results indicate the presence of a wide array of lithotypes from Italy, Greece (mainland and Aegean islands), *Asia Minor*, North Africa and Egypt, including varieties of white marble from Carrara, Proconnesos, Pentelikon, Thasos, Paros and Dokimeion.

I. INTRODUCTION

Roman society was highly hierarchical and its wealthy members were constantly striving to showcase, maintain and increase their status and prestige. Monumental architecture and sculpture were some of the most powerful means to this end. Ancient cities were lavishly adorned with marble statuary and marble(-clad) architecture, mainly through benefaction by members of the elite.
The importance of marble for Roman society, its durability, provenancing potential and chronological potential make marble studies a promising research subject for archaeologists and historians interested in the economy of Antiquity. Marble objects were traded in huge quantities and over long distances in the Roman period, much like other objects (wine, olive oil, pottery, etc.), and so reflect wider economic patterns [1].
In this paper, we wish to focus on (1) the provenance and use of marbles in central Adriatic Italy from a regional perspective, (2) how marble imports relate to the regional urbanisation process and (3) how the marble trade fits in the wider trade networks of the region.

II. STUDY AREA

The study area stretches out over c. 1,600 km^2 in central Adriatic Italy (Fig. 1) and includes the northern part of *Picenum* and the southern part of *Umbria et ager Gallicus*; the fifth and sixth districts respectively of Augustus' *Provincia Italia*. The study area is centred on the Roman town of Ancona, a major port of the Roman Adriatic, and is bordered by the *via Flaminia* to the north and the *via Salaria* to the south The western and eastern boundaries are marked by the Apennines and the Adriatic shoreline.

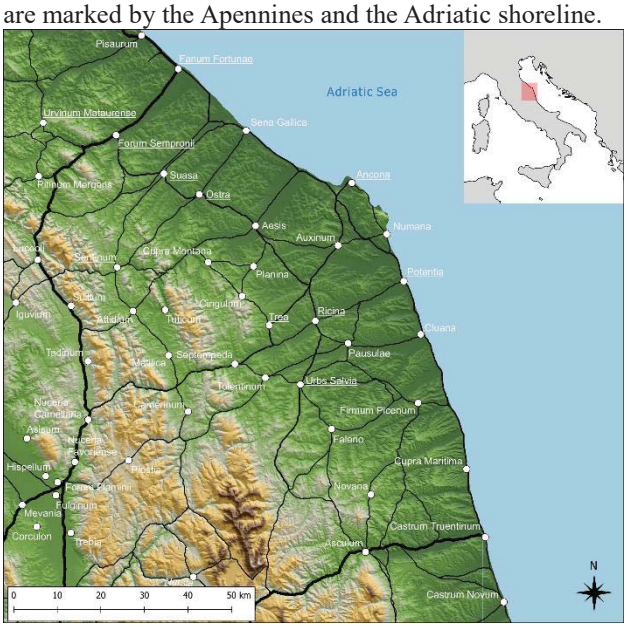

Fig. 1. Map of central Adriatic Italy in Roman times, with indication of the case study sites (underlined) and the Roman road system.

Roman presence in central Adriatic Italy was the result of a long and turbulent annexation process between the late 4th century BCE and the second quarter of the 3rd century BCE. Of specific importance for the spread of Roman culture in the region was the construction of the *via Flaminia* [2] and the extension of the *via Salaria* in the late 3rd century BCE, two main road arteries of Roman Italy, as well as the foundation of several colony towns from the 280s BCE onwards. Following the Roman reorganisation of the *ager Picenus* and *ager Gallicus* after the Social War (91–88 BCE), many urban centres received the status of

municipium (especially after the middle 1st century BCE) and several new towns were established with urban structures that reflected the new political-administrative situation of the region [3]. These events resulted in central Adriatic Italy becoming one of the most densely urbanised regions of the Roman world with urbanisation rates comparable to those for *Latium* and *Campania* in Italy and *Baetica* on the Iberian Peninsula [4]. Already in the Late Republic, but especially in the Early and Middle Empire, many towns in the region were monumentalised [3] and received lavish marble decoration.

Typical for the Roman age urbanisation of central Adriatic Italy was the apparent oversizing of public space compared to the relatively small town centre (Fig. 2) [4–7]. This suggests that the towns acted as a kind of service centres not only for their inhabitants but also (and especially?) for the surrounding countryside [3].

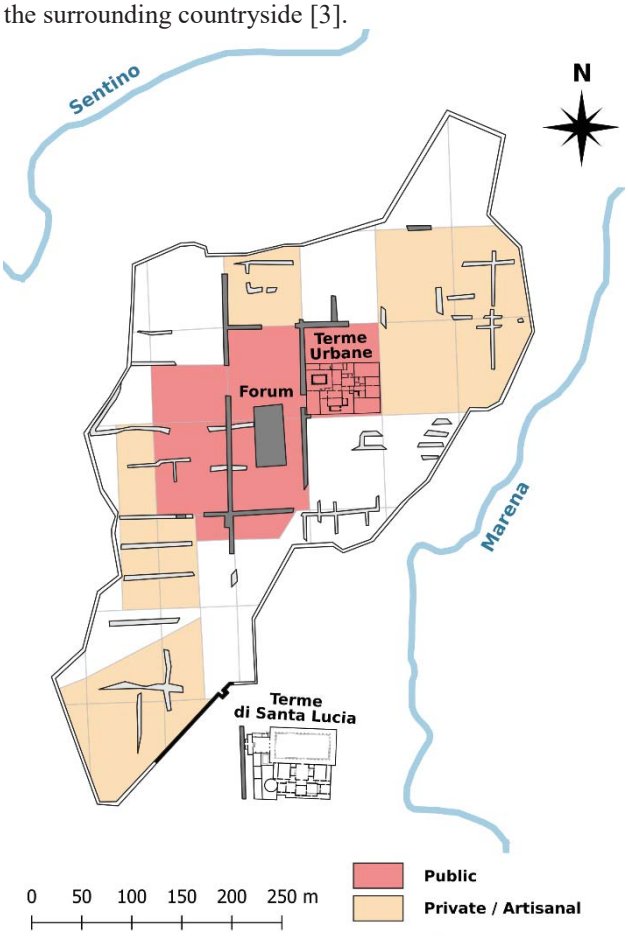

Fig. 2. Plan of the Roman town of Sentinum with indication of public spaces (plan after [8]).

III. MARBLE DATA AND PROVENANCE METHODOLOGY

This contribution is based on marble data from eleven towns in central Adriatic Italy (Ancona, *Fanum Fortunae*, *Forum Sempronii*, *Ricina*, *Ostra*, *Potentia*, *Sentinum*, *Suasa*, *Trea*, *Urbs Salvia* and *Urvinum Mataurense*). The chronology of the studied contexts spans the late 2nd century BCE to roughly the 3rd century CE.

Systematic material studies and archaeometric provenance analyses were carried out for six sites. A representative selection of samples of white and *greco scritto*-like marbles of each site was analysed using a standardly accepted multi-technique approach combining mineralogical-petrographic observations and stable C–O isotopic analysis. Samples were selected to maximize lithological, contextual and chronological variability. For each sample, microstructure, maximum grain size (MGS), calcite boundary shapes and accessory minerals were determined in thin section under a polarising microscope. The presence of dolomite was evaluated through X-ray diffraction (XRD). Ratios of stable carbon and oxygen isotopes ($\delta^{13}C$ and $\delta^{18}O$) were determined using a Gasbench II preparation line connected online to a ThermoFinnigan Five Plus mass spectrometer in a continuous flow mode. Samples were reacted with 100 % phosphoric acid at 70 °C. Stable isotope results are expressed in δ (‰) values, relative to the international PDB standard. Petrographic, mineralogic and isotopic results were compared with data from literature [9–11].

Polychrome marbles were identified macroscopically on the basis of the specific knowledge of the authors and by comparison with reference samples [12–14].

The gathered marble data was complemented with published marble data for the region [15–23].

IV. MAIN MARBLE PROVENANCE RESULTS

A. Early imports

The earliest evidence of marble use in central Adriatic Italy comes from Ancona where the material was used for twelve funerary *stelae* with Greek inscriptions and carved in Delian tradition of the later 2nd and early 1st centuries BCE. Archaeometric analyses identified the reliefs as carved in marble from Paros (Lakkoi variety), Carrara, Proconnesos and in local limestone from the *Scaglia Rossa* formation (Fig. 3) [17].

Considering the stylistic and iconographic similarity of the Ancona *stelae* with contemporary productions from Delos, the prevalence of Parian marble (8) is not surprising and suggests a direct import of the *stelae* from the Aegean probably in finished state. The presence of *stelae* carved in Carrara (2) and Proconnesian (1) marble, as well as in local limestone (1), are particularly interesting. The fact that these *stelae* are stylistically very similar to the Parian examples suggests they were carved by itinerant sculptors from Delos or local craftsmen trained by Delian sculptors [17]. The identification of Carrara and Proconnesian marble provides also the earliest evidence for the distribution of these marbles outside central Tyrrhenian Italy and Asia Minor, respectively.

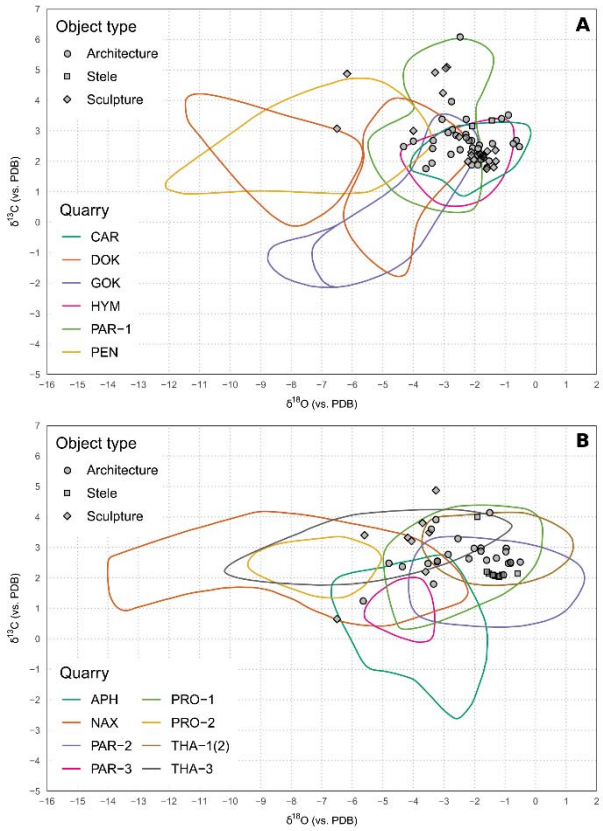

Fig. 3. Stable isotope diagrams of the marble objects from central Adriatic Italy. (A) Fine-grained marbles (MGS ≤ 2 mm); (B) Medium- and coarse-grained marbles (MGS > 2 mm). Quarry abbreviations: APH = Aphrodisias, CAR = Carrara, DOK = Dokimeion (Afyon), GOK = Göktepe, HYM = Hymettos, NAX = Naxos, PAR-1 = Paros-1, PAR-2 = Paros-2, PAR-3 = Paros-3, PEN = Pentelikon, PRO-1 = Proconnesos-1, PRO-2 = Proconnesos-2, THA-1(2) = Thasos-1(2), THA-3 = Thasos-3. Quarry fields from [9].

B. Statuary marble

Imports of marble statuary peaked in the Late Republic and even more so in the Julio-Claudian period, with Parian and Carrara marble dominating (Fig. 4). Greek marbles (Pentelic, Thasian and especially Parian, both the lychnites and non-lychnites variety) seem to have been reserved mainly for religious statuary and imperial portraiture. Marble for non-imperial official statuary, such as *togati* and private portraiture, were almost exclusively obtained in the Carrara quarries (Fig. 3 and 4).

The dominance of Parian and Carrara marble can be explained by the early chronology of the statuary, with most statues dated to the Julio-Claudian period.

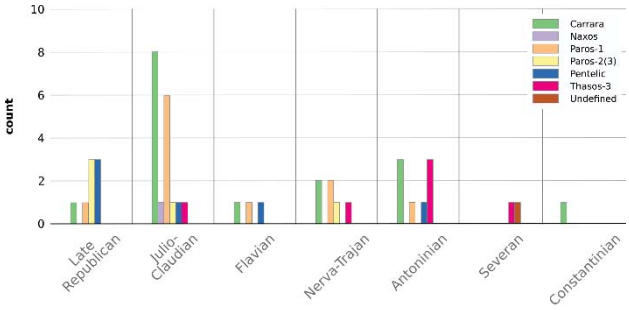

Fig. 4. Chronological distribution and suggested quarry provenance of the Roman white marble statuary in central Adriatic Italy.

C. Architectural marble

Widespread use of architectural marble started in the Flavian period and peaked in the 2nd century CE when many new monumental buildings were erected and existing buildings were renovated. In this period, polychrome marbles also start being imported. The first large-scale uses of architectural marble are the house of the Coiedii in *Suasa*, the marble renovation of the theatre of *Urvinum Mataurense* [22] and the marble panoramas of towns like *Trea* [23] and *Urbs Salvia* [19].

Proconnesos and Carrara were the prime suppliers for architectural white marble (Fig. 3 and 5). The Arch of Trajan in Ancona (114–115 CE) stands out as a prime example of Proconnesian marble use to this purpose [20]. Other cases are the two bath complexes in *Sentinum* (unpublished results) and the theatre in *Urvinum Mataurense* [22]. Pentelic, Dokimeion, Parian and Thasian (dolomitic variety) marbles were used at times for more elaborated applications such as capitals and pediments (Fig. 3 and 5).

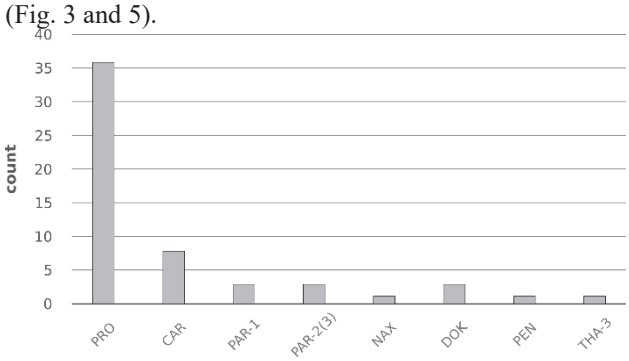

Fig. 5. Provenance of the white marbles samples used for architectural purposes (spanned from Flavian period to the 2nd century CE). Quarry abbreviations are PRO = Proconnesos, CAR = Carrara, PAR-1 = Paros-1, PAR-2(3) = Paros-2(3), NAX = Naxos, DOK = Dokimeion (Afyon), PEN = Pentelikon, THA-3 = Thasos-3.

Imported polychrome marbles concern foremost *giallo antico*, *greco scritto*, *portasanta*, *africano*, *breccia di Sciro*, *breccia corallina*, *cipollino verde*, *fior di pesco*, *pavonazzetto* and *rosso antico*. More rare and prestigious imports concern *serpentino*, *porfido rosso* and *granito*

verde della sedia di San Lorenzo, as well as Iberian and Aquitanian imports (at *Urbs Salvia*) such as *brocatello* and *cipollino mandolato* respectively [19].

Particular noteworthy are the presence of *breccia medicea* at *Urvinum Mataurense* – which represents the earliest major in situ use of this marble in a Roman context [22] – and the identification of *rosso ammonitico* at *Urbs Salvia*, *Sentinum*, *Suasa* and *Urvinum Mataurense*. The latter, a brown red-to-salmon-pink nodular limestone with abundant ammonites and other fossils of Jurassic age, is the only decorative stone that can be traced back to the region, specifically to the central Adriatic Apennines [21].

For the *greco scritto*-like marbles, analyses suggest the Hasançavuslar quarries, near Ephesos, as the most like source (Fig. 6A). The mineralogical–petrographic data of the central Adriatic samples of *greco scritto* exclude an Algerian origin for the marble from Cap de Garde whereas the ratios of stable oxygen and carbon isotopes fit the data set well in terms of the quarries exploited in Hasançavuslar, in the Ephesos region. Nonetheless, to date, detailed petrographic descriptions of a sufficiently large set of samples of the Hasançavuslar marble are still unpublished (greatly limiting the comparative studies) and a different origin (Kavala in Greece, other sites near Ephesos, or Proconnesos and other localities of the north-western coast of Anatolia in Turkey) [24–25] cannot therefore be unequivocally ruled out, especially considering the maximum grain sizes of some central Adriatic samples (some samples have a MGS between 3.25 and 4.30 mm) (Fig. 6B).

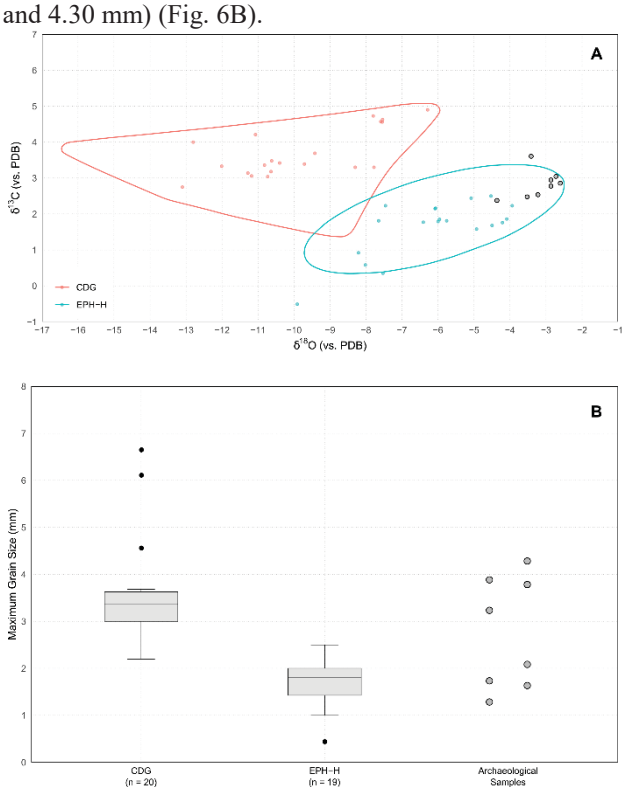

Fig. 6. Greco scritto-like marble objects from central Adriatic Italy: (A) Stable isotope diagram, (B) Boxplot of maximum grain size. Quarry abbreviations: CDG = Cap de Garde, EPH-H = Ephesos - Hasançavuslar. Quarry data from [10–11]

V. DISCUSSION

Roman penetration into central Adriatic Italy from the early 3rd century BCE onwards profoundly changed the focus, nature and scale of trade in the Adriatic. Early Greek relations with non-Greek areas of Italy had been limited, but would by the end of the 3rd century BCE be supplanted by an increasingly intense trade corridor with the northern Adriatic. Of key importance here were Rome's actions to combat Illyrian piracy in the Adriatic (leading to the First Illyrian War in 229 BCE), thus securing trans-Adriatic trade. These events, together with the encroachment of the middle Adriatic area – apace with the start of urbanisation and the installation of a Roman elite in the region – led to increased (trade) contacts between central Adriatic Italy and the Aegean in the Late Republic. As discussed above, this evolution can be seen in the imports of luxury goods such as the *stelae* in Parian marble in Ancona, probably via the important trading hub of Delos (which became a free-trading centre in 167 BC), where epigraphy also attests to the presence of rich individuals from Ancona [17]. However, the best evidence of this close interaction between the Adriatic and the Aegean in the Late Republic are the abundant material remains (amphorae) of the wine trade that developed betwixt hem. Drinking wine was fashionable in the Adriatic since at least the mid-6th century BCE (via the process of Hellenization), and the habit found keen consumers in the many Italic and Illyrian elites [26]. So too in Adriatic Italy, where the arrival of Greek wines (perhaps from Corinth) predates the Roman conquest [27–28], but intensifies with the influx of Roman colonists from the mid-3rd century BCE onwards, with Rhodian wine becoming a particular popular commodity [29–30]. In the 2nd/1st century BCE, the central Adriatic area itself also becomes an important wine exporter (in Greco-Italic and later Lamboglia 2 amphorae), with Delos again as a major destination [31–32].

The link with the Eastern Mediterranean is further also illustrated by the importance of Proconessian marble. Already in the late 2nd and the early 1st centuries BCE, Proconnesian imports start to appear, making this among the earliest uses of the material in Italy and probably in the Roman West. At the start of the 2nd century CE, Proconnesos even became the region's main architectural marble supplier. Interestingly, as is shown in particular by the Arch of Trajan, the architectural use of Proconnesian marble in the region seemingly predates that of the rest of Italy. For example, in Rome, the material is attested in large quantities only after the Trajanic–Hadrianic period [33]. The reason for the dominant use of Proconnesian marble in architecture perhaps lies in the ease of overseas transport for Proconnesian imports with respect to the difficulties of sailing around the Italic Peninsula or the

crossing overland for Carrara marble.

Overall, it seems that central Adriatic Italy was strongly integrated in the Mediterranean marble trade, with imports from Italy, Greece (mainland and Aegean islands), Asia Minor, Egypt and North Africa. The relative ease with which the region obtained such a wide variety of marbles is undoubtedly related to its strategic geographic position along important and century-old trade routes between the Mediterranean, in the south, and the Danubian provinces, in the north. This research so highlights the Adriatic's role as a unique transit hub in ancient geopolitical trade networks, from those of Greek merchants in the 4th/3rd century BCE in search of rare natural resources in central and northern Europe, to Roman supply lines for the troops in *Dalmatia*, *Noricum* and *Pannonia*.

VI. CONCLUSIONS

The intense Romanisation of central Adriatic Italy in the Late Republic resulted in a densely urbanized landscape with typical Roman architecture. In the later 2nd century BCE, and even more so from the late 1st century BCE / early 1st century CE, the elite invested in marble objects (mainly *stelae* and statuary in the beginning) to embellish their towns. From the late 1st century CE and during the 2nd century CE, there was a shift towards architectural munificence, resulting in the renovation of monumental public buildings and the application of marble decoration. In this phenomenon of marmorisation of the urban landscape, the link with the Eastern Mediterranean is obvious. Moreover, it is clear that central Adriatic Italy was able to profit from its position along some of the main trade corridors of that period, i.e. those that connected the Mediterranean with the Danubian provinces.

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