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## Donato Attanasio – Matthias Bruno – Walter Prochaska **The Marbles of the Roman Villa of Chiragan at Martres-Tolosane (Gallia Narbonensis)**

aus / from

### **Archäologischer Anzeiger**

Ausgabe / Issue **1 • 2016**

Seite / Page **169–200**

<https://publications.dainst.org/journals/aa/1933/5964> • urn:nbn:de:0048-journals.aa-2016-1-p169-200-v5964.9

Verantwortliche Redaktion / Publishing editor

**Redaktion der Zentrale | Deutsches Archäologisches Institut**

Weitere Informationen unter / For further information see <https://publications.dainst.org/journals/aa>

ISSN der Online-Ausgabe / ISSN of the online edition **2510-4713**

Verlag / Publisher **Ernst Wasmuth Verlag GmbH & Co. Tübingen**

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## The Marbles of the Roman Villa of Chiragan at Martres-Tolosane (Gallia Narbonensis)

### Introduction

This paper presents a study of provenance of the material of 100 marble artefacts, mostly sculptural, that decorated the Roman villa of Chiragan, located at Martres-Tolosane near the western border of Gallia Narbonensis approximately 60 km SW of Toulouse<sup>1</sup>. Reporting the results of this study we wish to express our deep gratitude to Évelyne Ugaglia, director of the Musée Saint-Raymond, who made possible this work and, together with the entire staff of the Museum, constantly supported us with her interest and assistance.

Chiragan was excavated by Alexandre du Mège, Albert Lebègue and Léon Joulin during several campaigns lasting from the early 19<sup>th</sup> to the beginning of the 20<sup>th</sup> century<sup>2</sup>. Studies carried out on the masonry techniques and the coins found at the site indicate that the villa existed since the Augustan period till at least the early 5<sup>th</sup> century A.D. In the course of its history Chiragan underwent three major renovations, the first during the early Empire and the others in later periods. Unfortunately nothing is visible today at Chiragan and the only and yet outstanding legacy of this luxurious country residence that Joulin did not hesitate to compare with the imperial villa built by Hadrian near Tivoli<sup>3</sup> are the remains of some 200 sculptures that, for some unknown reason, were broken in pieces and buried within the villa itself. After several restorations and relocations they are now part of the collections of the Musée Saint-Raymond at Toulouse.

As a matter of fact the survival at Chiragan of such a large collection of sculptures has almost no parallels among the many late antique villas that flourished in Italy and in many other provinces of the Empire. Since their discovery the Chiragan sculptures aroused much scholarly interest and have been the subject of continuing investigations that are still under way<sup>4</sup>. Our knowledge of the archaeological and art-historical problems raised by the Chiragan sculptures and the initial stimulus to undertake the present work stem primarily from the work carried out by many scholars such as Niels Hannestad, Jean-Charles Balty, Marianne Bergmann, Lea M. Stirling and others, whom we gratefully acknowledge.

As it is obvious for a great residence that remained in use for about four centuries the sculptures discovered at Chiragan include several different types and styles and were made in different periods of time for a variety of purposes. As such they pose quite different problems of interpretation and are better considered separately.

The first group to be mentioned includes twelve bas-reliefs approximately 1.30 m high representing the labours of Herakles (Fig. 1) and a series of large *tondos* or *clipei* (1 m diameter) bearing busts of divinities and mythological

1 The results obtained by analyzing the collection of Chiragan portraits prompted us to extend the study also to eleven imperial portraits that were discovered at Béziers in the 19<sup>th</sup> century and are now part of the collections of the Musée Saint-Raymond at Toulouse.

2 For a history of the excavations at Chiragan see Cazes – Ugaglia 1999; Cazes 2005.

3 Joulin 1901, 597.

4 Beside the papers and monographs published long ago by du Mège (1835) and Joulin (1901), detailed studies have been undertaken recently by Balty (1995, 2005, 2008, 2012), Bergmann (1995, 1999, 2000, 2007), Hannestad (1994, 2007), Stirling (2005, 2007), and others.

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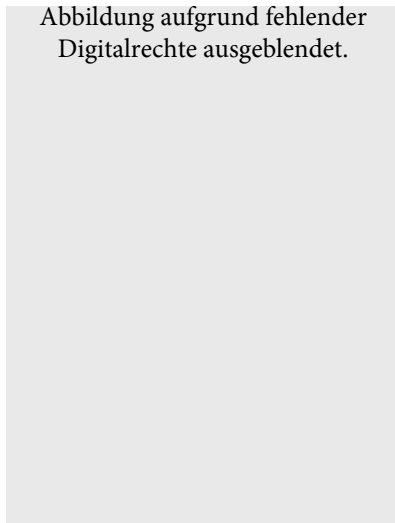
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Figs. 1 a. b Herakles' reliefs, left: Herakles capturing the Erymanthian boar (no. 4, inv. Ra28d); right: Herakles cleaning the Augean stables (no. 10, inv. Ra28j), St B at marble

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Figs. 2 a. b Mythological tondos, left: Cybele (no. 19, inv. Ra34i); right: Attis (no. 22, inv. Ra34l), St B at marble



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Fig. 3 Portrait of the owner of Chiragan, indentified by Balty with the Emperor Maximian Herculus (no. 94, inv. Ra341), St B at marble

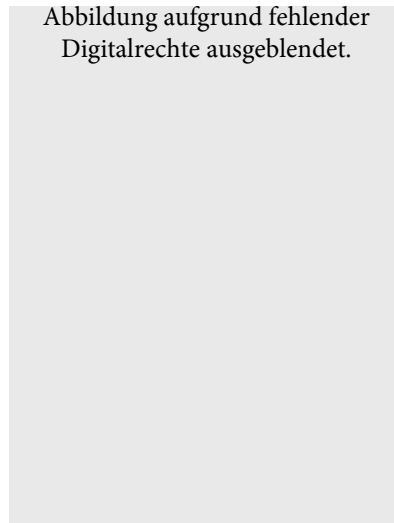
Fig. 4 Members of the Chiragan owner's family indentified by Balty as Maxentius (a: no. 97, inv. Ra93; b: no. 100, inv. 2000.182.1), Valeria Galeria Eutropia (c: no. 98, inv. Ra38), Valeria Maximilla (d: no. 96, inv. Ra127). Head 2000.182.1 is Carrara marble, all other portraits are St B at marble

<sup>5</sup> A second portrait of the same personage also found at Chiragan was not tested.

<sup>6</sup> Balty – Cazes 2008, 123–140.

<sup>7</sup> Bergmann 1999, 40 f.; Bergmann 2007, 226 n. 25.

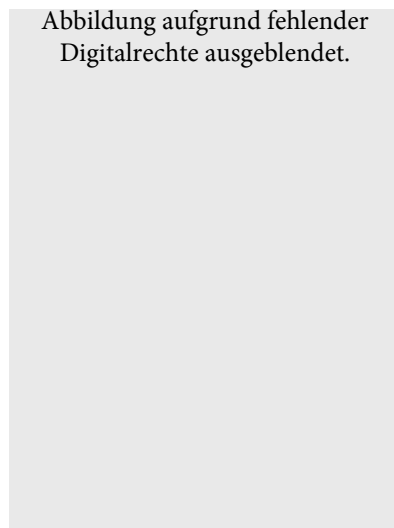
<sup>8</sup> Bergmann 2000, 168–171. The suggestion that the Aconii might have been the owners of Chiragan stems from the inscription found on the fragmentary base (no. 86, inv. 31.087) of a now lost late Imperial bust (see also Eck 2000, 172 f.). Bergmann notes that the name Aconii remained long associated with the site that still in the 16<sup>th</sup> century was known as Angonia.



4 a



4 b



4 c



4 d

figures (Fig. 2). Five portraits are stylistically tightly associated with this group and there is unanimous consensus that all these sculptures were part of a single, strictly unitary decorative project brought to completion by a workshop of Aphrodisian sculptors probably coming from Rome. Identification of the portraits that would be crucial for dating the sculptures, however, is controversial. On the basis of some iconographic elements and considerations on the relative portrait size Balty assumes that they may represent an imperial family group including the Emperor Maximian Herculus (no. 94, inv. Ra341; Fig. 3)<sup>5</sup>, his son Maxentius (no. 97, inv. Ra93 and no. 100, inv. 2000.182.1; Figs. 4 a. b) and their wives Valeria Eutropia (no. 98, inv. Ra38; Fig. 4 c) and Valeria Maximilla (no. 96, inv. Ra127; Fig. 4 d)<sup>6</sup>. The hypothesis is that the Emperor, who reigned from 286 to 305 A.D. could have lived in the villa during his campaigns in Gaul, Spain and North Africa. No conclusive evidence, however, does exist and Bergmann suggests a considerably later chronology (mid or second half of the 4<sup>th</sup> century A.D.) based on the hairstyle of the female portraits<sup>7</sup>. She identifies the portraits as a family group representing the owners of the villa that might have been part of the gens Aconia<sup>8</sup>. The proposed

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Fig. 5 General view of the hall of imperial portraits in the Musée Saint-Raymond at Toulouse

chronologies differ by approximately 80 years and bring us from the end of the 3<sup>rd</sup> century A.D. to the mid second half of the 4<sup>th</sup> century. It is worth adding that unfortunately the marble study did not provide clear hints for solving this crucial problem.

No scientific testing has ever been carried out. However, a single type of marble seems to have been used for all the sculptures mentioned above and it has been assumed, on the basis of visual examination, that it may originate from the local quarries of St Béat located on the northern slope of the Pyrénées approximately 40 km SW of Martres-Tolosane. Bergmann, however, has pointed out the macroscopic similarities existing between the marble of St Béat and the marble of the so-called urban quarries of Aphrodisias and has suggested that the marble provenance problem, crucial for understanding important aspects of sculptural manufacture and marble circulation in Roman times, should be solved with certainty on the basis of scientific analyses<sup>9</sup>.

A second group of sculptures includes an exceptional collection of more than 50 private and imperial portraits (Fig. 5). Emperors from Augustus to Philip the Arab and his son Philip II the Younger, who reigned from A.D. 244 to 249, are represented and suggest that the collection was assembled during a long period of time spanning approximately three centuries<sup>10</sup>. Later pieces, such as sample no. 95, inv. Ra82, a private female portrait shown in Figure 6 or perhaps a portrait related to the family of Theodosius the Great (A.D. 379–395)<sup>11</sup>, are also present. The portrait is dated to the end of the 4<sup>th</sup> century A.D.

<sup>9</sup> Bergmann 1995, 203.

<sup>10</sup> Different opinions have been expressed on the way the collection was assembled. Hannestad, referring to the traces of ancient reworking and repairs shown by many sculptures, argues that the collection was set up in the fourth century during the final adornment of the villa (Hannestad 1994, 128–133; 2007, 294 f.). Kiilerich (2011,

366) has suggested that in the same period the villa might have housed a commercial enterprise dealing with the trade of sculptures. Bergmann, however, has shown that most repairs are modern and the few truly ancient are fully compatible with the practices normally adopted by Roman workshops (Bergmann 2007). In addition the presence in Rome and Chiragan of copies

of private portraits demonstrates the close relations of the villa owners to Italy during the high Empire. These observations strongly suggest that the collection was slowly assembled over more than two centuries starting in the early empire.

<sup>11</sup> Sada 1996, 49 cat. 7.

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Fig. 6 Late antique female portrait from Chiragan dated to the end of 4<sup>th</sup> or beginning of 5<sup>th</sup> century A.D. (no. 95, inv. Ra82), St B at marble

and therefore only slightly later than the portraits of the owners of the villa in the interpretation given by Bergmann. The Chiragan portraits provide an ample, almost complete cross-section of Roman portraiture, a form of art that played a major role in the embellishment of public and private spaces.

Scholarly studies suggest that the portraits are works of the highest level sculpted following urban standards and very probably imported from Rome. Portraits representing the same persons as some portraits in Chiragan do exist in Rome<sup>12</sup> and support the hypothesis that the owners of the villa had their residence both in Gallia and in the capital and were probably part of the provincial elite holding official positions in Rome. Apparently they imported imperial and family portraits to Chiragan on a regular basis from the 1<sup>st</sup> century A.D. to the mid 3<sup>rd</sup> century when this aspect of the collection came to an end probably in connection with the secession of Gallia promoted by Postumus around the year 260<sup>13</sup>. Later on a few more portraits, such as the family group or the female sculpture Ra82 mentioned above, were made locally, as suggested by the marble used, and, although belonging to a different story, became part of the Chiragan collection.

In agreement with the above hypotheses most portraits have been considered, upon visual inspection, to be made of Luna marble from Carrara, although other marbles, most probably Greek, also appear. At present, however, after the discovery of the G ktepe marble quarries not far from Aphrodisias<sup>14</sup>, the panorama of the most prized sculptural marbles used in Roman antiquity has deeply changed and visual identification of Carrara marble must be considered cautiously.

It is known, in fact, that the G ktepe and Luna marbles are quite similar not only macroscopically but also petrographically and isotopically and can be distinguished only on the basis of their different trace composition, concerning primarily the presence and concentration of the strontium and manganese impurities<sup>15</sup>. On this basis it has been demonstrated that, starting with the age of Hadrian, the G ktepe white marble became one of the most prized varieties, used exclusively for high quality sculpture. Several Carrara identifications claimed in the past and based on visual inspection or even on isotopic and petrographic data are, in fact, wrong<sup>16</sup> and indicate that careful verification is necessary in the light of the new emerging panorama of sculptural marbles used in imperial times. From this point of view Chiragan offers a unique possibility of verifying the actual use of marble on a collection of portraits ranging from the beginning of the Empire to its late period and illustrative of many similar collections that were set up by Emperors or members of the Roman elite.

Beside the two groups of sculptures mentioned above, many more marbles were unearthed at Chiragan. They include architectural and decorative elements such as capitals, friezes, decorated pillars etc., but also statues and statuettes that encompass a variety of themes and were commonly part of the decoration of a Roman villa.

**12** Bergmann (1999, 30 n. 151, 152, 155; 2007 pls. 94–97) mentions three, or perhaps four, portraits one in Perugia, two in the Capitoline Museums and the Corsini collection at Rome and the last one possibly in one of the Aurelian reliefs on the arch of Constantine.

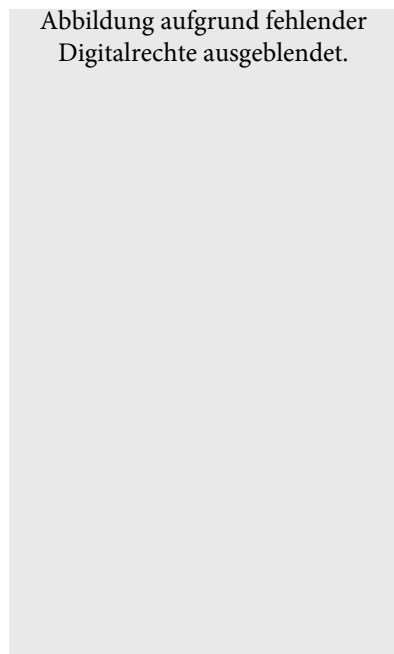
**13** Bergmann 2000, 169.

**14** Yavuz et al. 2011; Attanasio et al. 2009.

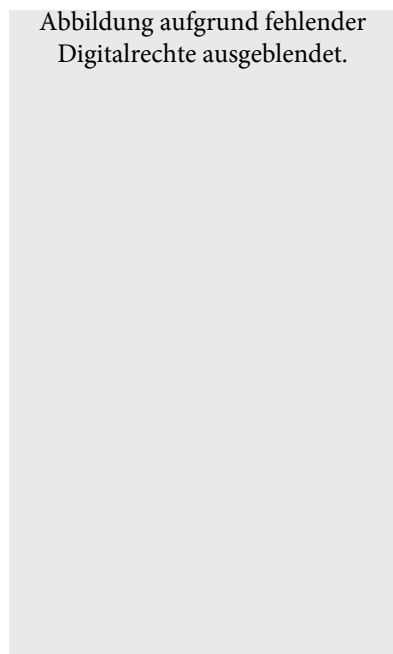
**15** Attanasio et al. 2015a.

**16** The most striking example is certainly provided by the sculptures of the so-called Esquiline group in the Ny Carlsberg Glyptotek at Copenhagen. Long before the discovery of the G ktepe

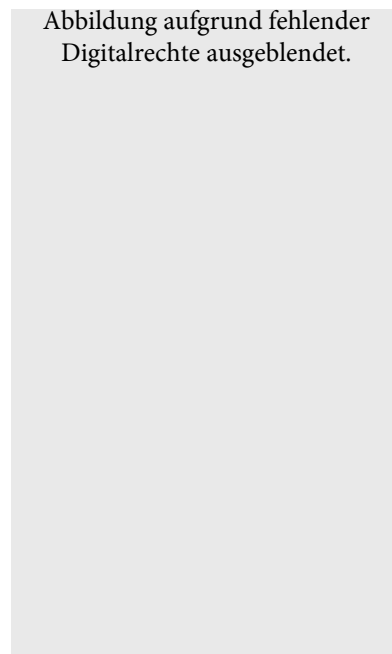
quarries the marble was identified as Luna marble from Carrara on the basis of isotopic data (Matthews – Walker 1990). More recent studies, however, demonstrate that the marble of the Esquiline sculptures originates from G ktepe (Attanasio et al. 2009, 338; Attanasio et al. 2015b).



7 a



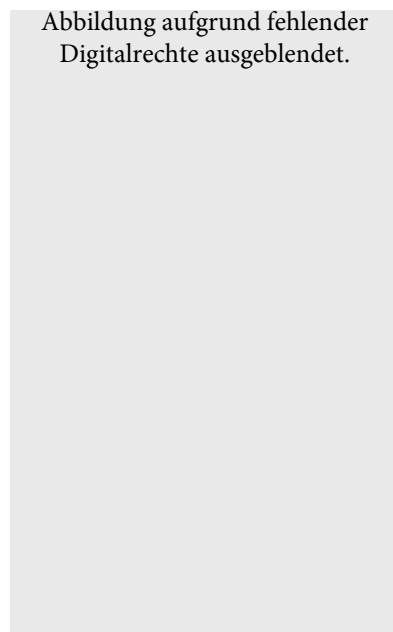
7 b



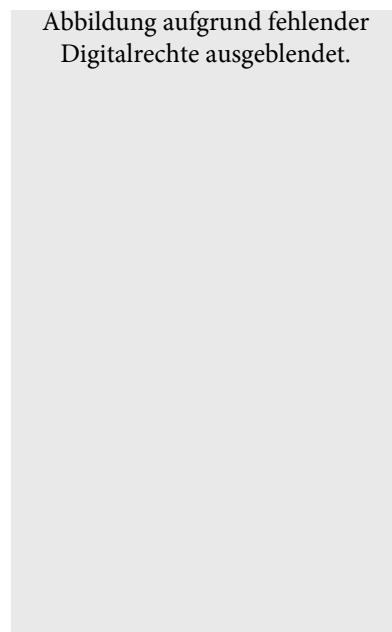
7 c



7 d



7 e



7 f

Especially important in this context are six statuettes shown in Figure 7 (Herakles, no. 31, inv. Ra115; Dionysos, no. 32, inv. Ra134–137; Athena, no. 33, inv. Ra113; Faun, no. 34, inv. Ra131; black fisherman, no. 37, inv. Ra46; Asklepios, no. 38, inv. Ra41) and two fragmentary vases shown in Figure 8 made of white (no. 35, inv. Ra181) and black (no. 36, inv. Ra99) marble, respectively. Although most of the above artefacts have been dated to the mid or late 4<sup>th</sup> century<sup>17</sup>, others, specifically the statuette of Asklepios and probably also the Athena are earlier. None of them is connected with the Aphrodisian sculptures mentioned above. Nevertheless, they are also typical products of Asiatic workmanship and were probably not made on site but im-

Fig. 7 Small-scale ideal sculptures from Chiragan: Herakles (a: no. 31, inv. Ra115), Dionysos (b: no. 32, inv. Ra134–137), Athena (c: no. 33, inv. Ra113), head of Faun (d: no. 34, inv. Ra131), Fisherman (e: no. 37, inv. Ra46), Asklepios (f: no. 38; inv. Ra41). Asklepios is made of Docimium marble, all other statuettes are marble of Göktepe

<sup>17</sup> Bergmann 1999, 68–71.

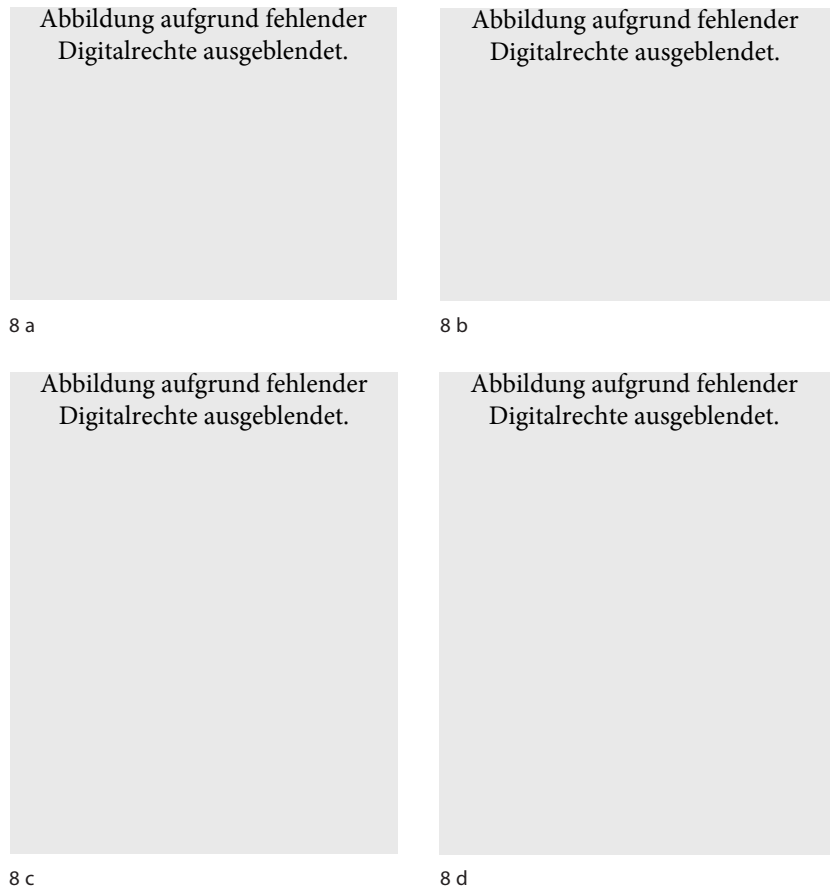


Fig. 8 Fragmentary white (a: no. 35, inv. Ra181) and black (b: no. 36, inv. Ra99) vases from Chiragan and related black vases at the Museo Nazionale Romano (c: inv. 67629) and the Museum of Aphrodisias (d: exc. 72–280). All items are white or black marble of Göktepe

ported to Chiragan as finished products at various times including presumably the period when the villa and its furnishings were being refurbished.

It is obvious that determining scientifically the provenance of the marbles briefly mentioned so far, although certainly does not solve all the problems connected with the Chiragan collection, nevertheless may provide crucial information on the sculptures themselves, the way they were produced or imported, the use of marble in such large and rich residential buildings and the way it evolved with time. More explicitly detailed information on the provenance of the Chiragan marbles may help to understand the relations existing between Aphrodisias and the Chiragan patrons. This is especially true in late antiquity when the owners of the villa were presumably trying to emulate the new capital Constantinople where the taste of Aphrodisian and other Asiatic workshops was dominant<sup>18</sup>. The results of the analyses, however, will show that the ›Aphrodisian link‹ was operating much earlier, when the portraits were being collected. In this case the connection took different routes which await to be explored in more detail.

### Sampling

Whenever possible systematic sampling of all the sculptures mentioned in the introduction was carried out. In this way 100 artefacts from Chiragan and 11 from Béziers were sampled. They are summarized below, whereas the full list is given in Table 1, together with the values of most important analytical properties and the provenance results discussed in the following:

<sup>18</sup> Bergmann 2000, 170.



GROUP	ARTEFACT <sup>19</sup>
Herakles reliefs	12 reliefs and 3 relief's fragments (15 samples)
<i>Clipei</i>	9 tondos (9 samples)
Other artefacts	8 sculptures, 9 architectural elements (18 samples)
Private and Imperial portraits	59 portraits (62 samples)
Imperial portraits from Béziers	11 portraits (11 samples)
TOTAL	100 Chiragan and 11 Béziers artefacts (115 samples)

All the samples were tiny marble chips measuring a few mm<sup>2</sup> and drawn from existing fractures or hidden parts of the artefacts so as to avoid any visible damage. They were first carefully cleaned of weathered material, patinas and crusts and then polished for the measurement of grain size. Subsequently they were ground to fine powders to carry out the EPR, isotopic, and chemical analyses briefly described in the next section.

### Analytical and Provenancing Techniques

The provenance of the samples was established using multiple analytical techniques and statistical data analysis for processing the experimental data and selecting the most probable provenance quarry among a suitable selection of likely sources (database). The method as originally developed and described in detail elsewhere<sup>20</sup> uses EPR spectroscopy, isotopic analysis and petrographic data to obtain the necessary experimental information. Recently, however, trace analysis determining the presence and concentration of various metal impurities in marble has been added to the analytical techniques already mentioned. Update of the method became necessary after the discovery of the Göktepe marble quarries near Aphrodisias. Extensive analytical work, in fact, has shown that the marbles of Göktepe can be easily and unequivocally identified only on the basis of their unique trace composition and especially for their extremely high and unparalleled content of strontium<sup>21</sup>. In this way the uncertainties that may arise using the older approach and refer specifically to the Göktepe/Afyon and Göktepe/Carrara discrimination are easily solved. In the present work, however, the use of trace data has been limited to the Chiragan portraits and to six additional samples whose provenance was not entirely certain.

All analyses were carried out using experimental methods and standardization procedures described in detail elsewhere<sup>22</sup> and gave rise to the following set of eight discriminant variables:

Isotopic variables:	$\delta^{18}\text{O}$ , $\delta^{13}\text{C}$
EPR variables:	INTENS (spectral intensity), W (spectral linewidth)
Trace element variables:	Sr, Mn
Petrography:	MGS (maximum grain size), COLOUR (sample colour)

Subsequently the experimental values were statistically compared with a selection of possible provenance quarries with the aid of linear discriminant function analysis. The method provides a classification rule which can be used

**19** In the case of the faun no. 34, inv. Ra131 also the torso was sampled (inv. 2005.1.1), because the two fragments were recovered separately and it was not clear whether or not they belonged together. Double sampling was carried out also for portraits nos. 50, 58, and 78, because it was suspected that the heads and the busts were made using different marbles. The four samples are not included in Table 1, but the results of the analyses are briefly given in n. ii.

**20** Attanasio et al. 2006, 213–259.

**21** This result is due to Walter Prochaska and is reported in Attanasio et al. 2015a.

**22** Attanasio 2003, 81–100; Attanasio et al. 2006, 261–266; Prochaska – Grillo 2010; Prochaska 2013.

No.	Museum Inventory	Description	Location	MGS mm	$\delta^{18}\text{O}$ ‰	$\delta^{13}\text{C}$ ‰	Sr ppm <sup>i</sup>	EPR intensity %	EPR linewidth %	Provenance site	RP %	AP %
<b>Herakles' reliefs, 12 artefacts, 15 samples (12 reliefs and 3 fragments)</b>												
1	Ra28a	Herakles as beardless youth	Chiragan	0.8	-1.80	4.10		14.0	44.1	St Béat 1	76	48
2	Ra28b	Herakles and the Lernean Hydra	Chiragan	1.25	-1.72	4.01		13.4	46.1	St Béat 1	67	49
3	Ra28c	Head of the Cretan Bull	Chiragan	1.2	-1.83	3.93		52.4	53.1	St Béat 1	86	96
4	Ra28d	Herakles and the Erymanthian Boar	Chiragan	0.9	-1.97	3.90		91.3	54.2	St Béat 1	87	74
5	Ra28e	Herakles and Cerberus	Chiragan	1.2	-1.80	3.94		55.6	51.1	St Béat 1	92	93
6	Ra28f	Herakles in the garden of the Hesperides	Chiragan	1	-1.74	4.04		43.7	51.1	St Béat 1	88	81
7	Ra28g	Herakles and the Stymphalian birds	Chiragan	1.7	-1.82	4.04		45.8	49.2	St Béat 1	95	98
8	Ra28h	Herakles and Hippolyte	Chiragan	0.9	-1.86	3.96		58.2	50.1	St Béat 1	90	67
9	Ra28i	Herakles and Diomedes	Chiragan	1.4	-1.88	3.78		60.9	49.2	St Béat 1	95	95
10	Ra28j	Herakles cleaning the Augean stables	Chiragan	1.7	-1.96	3.90		114	52.2	St Béat 1	96	89
11	Ra28k	Bearded Herakles	Chiragan	1.1	-1.64	3.70		53.3	51.4	St Béat 1	89	89
12	Ra28l	Herakles and Geryon	Chiragan	1.1	-2.18	3.11		11.9	46.3	St Béat 1	74	70
13	Ra30	Fragmentary Athena	Chiragan	1.4	-1.91	4.06		23.4	43.2	St Béat 1	78	48
14	Ra139c	Fragmentary relief, bull's foot	Chiragan	1.1	-2.21	2.74		112	53.6	St Béat 1	53	71
15	2000.311.9	Fragmentary relief	Chiragan	0.7	-2.14	3.63		47.9	45.9	St Béat 1	91	72
<b>Clpei with gods and mythological figures, 9 artefacts, 9 samples</b>												
16	Ra34d	Hephaestus	Chiragan	1.1	-2.23	3.86		60.5	49.4	St Béat 1	92	86
17	Ra34f	Aphrodite	Chiragan	0.8	-1.75	3.97		40.5	50.4	St Béat 1	91	93
18	Ra34h	Artemis	Chiragan	1.1	-2.01	3.98		65.5	47.7	St Béat 1	96	69
19	Ra34i	Cybele	Chiragan		-2.12	3.79		59.7	47.4	St Béat 1	96	87
20	Ra34j	Athena	Chiragan	1.3	-1.93	3.57		63.9	47.5	St Béat 1	96	86
21	Ra34k	Hygieia	Chiragan	1.3	-1.75	4.03		44.7	49.3	St Béat 1	94	92
22	Ra34l	Attis	Chiragan	1.3	-1.70	3.79		49.0	49.5	St Béat 1	93	93
23	Ra34m	Asclepius	Chiragan	1.2	-1.91	3.96		79.5	49.5	St Béat 1	96	80
24	Ra51bis	Hera	Chiragan		-2.32	3.85		122	51.4	St Béat 1	95	77
<b>Miscellaneous sculptural, architectural and decorative artefacts, 17 artefacts, 18 samples</b>												
25	Ra23a	Decorated pillar	Chiragan	2.2	-2.00	3.39		12.6	47.0	St Béat 1	98	85
26	Ra23d	Decorated pillar	Chiragan	2.2	-1.57	2.48		41.7	51.6	St Béat 1	61	60
27	Ra50bis	Relief with head	Chiragan		-1.93	3.91		62.3	49.7	St Béat 1	95	93
28	Ra95	Fragment of a relief with male head	Chiragan	1.6	-1.95	3.93		51.2	46.9	St Béat 1	97	92
29	Ra17bis	Capital	Chiragan?	1.75	-1.89	3.96		51.3	49.6	St Béat 1	95	99
30	Ra222a	Frieze with arms	Chiragan	1.7	-1.83	3.72		32.9	52.6	St Béat 1		
31	Ra115	Herakles, statuette	Chiragan	0.5	-2.50	2.79	377	2.9	44.3	Göktepe 3	64	30
32	Ra134–137	Dionysos, statuette	Chiragan	0.3	-2.76	2.85	635	8.3	56.5	Göktepe 3	57	18
33	Ra113	Athena, statuette	Chiragan	0.6	-2.51	2.72	364	3.7	47.9	Göktepe 3	83	68
34	Ra131	Head of faun	Chiragan	0.55	-2.40	2.68		4.2	52.6	Göktepe 3	90	72
35	RA181	White vase	Chiragan	0.5	-2.26	2.80	427	7.1	55.7	Göktepe 3	84	61
36	Ra 99	Black vase	Chiragan	0.45	-3.24	-0.04		6.3	70.5	Göktepe b		
37	Ra46	Black statuette of fisherman	Chiragan	0.2	-3.00	3.20		3.2	59.2	Göktepe b	56	24
38	Ra41	Asklepios, statuette	Chiragan	0.6	-4.50	2.29		96.8	62.4	Afyon	63	51
39	Ra25	Pilaster capital	Chiragan	0.9	-6.34	1.85		49.5	43.2	Afyon	56	3
40	Ra52	Head of Aphrodite	Chiragan	1.6	-3.01	4.53	189	10.8	47.6	Paros/Lychn	100	98
41	Ra38 (1)	Black Isis	Chiragan	1.7	-3.61	3.71		109	58.3	local St Béat marble		

<sup>i</sup> ppm = parts per million.

No.	Museum Inventory	Description	Location	MGS mm	$\delta^{18}\text{O}$ ‰	$\delta^{13}\text{C}$ ‰	Sr ppm	EPR intensity %	EPR linewidth %	Provenance site	RP %	AP %
<b>Private and Imperial portraits from Chiragan, 59 artefacts, 62 samples<sup>ii</sup></b>												
42	Ra73h	Head of Philip II the younger	Chiragan	0.6	-2.69	2.73	549	2.1	50.7	Göktepe 3	100	73
43	Ra73g	Male head	Chiragan	0.5	-2.60	2.82	840	4.0	53.5	Göktepe 3	98	81
44	Ra73f	Head of a partly bald male	Chiragan	0.4	-2.55	2.93	439	2.2	44.9	Göktepe 3	98	27
45	Ra168	Head of young Caracalla	Chiragan	0.5	-2.93	2.53	836	2.7	54.7	Göktepe 3	99	90
46	Ra120	Head of Septimius Severus	Chiragan	0.9	-2.76	2.72	484	2.9	48.8	Göktepe 3	97	59
47	RA126	Head of child	Chiragan	0.35	-2.61	2.60	563	4.2	52.6	Göktepe 3	91	82
48	RA78	Female head	Chiragan	0.5	-2.57	2.80	543	3.3	55.7	Göktepe 3	96	75
49	RA79	Female head	Chiragan	0.4	-2.78	2.73	671	0.9	43.0	Göktepe 3	100	25
50	RA124	Bust of a child	Chiragan	0.3	-2.66	1.98	401	3.1	63.8	Göktepe 3	93	31
51	Ra58b	Head of Trajan	Chiragan	0.35	-2.48	3.10	789	3.3	54.5	Göktepe 3	99	79
52	RA77	Female bust	Chiragan	0.5	-2.68	2.74	585	2.8	53.5	Göktepe 3	99	88
53	Ra73e	Cuirassed male bust	Chiragan	0.4	-2.64	2.74	624	1.6	51.7	Göktepe 3	100	66
54	Ra60 (1)	Head of Antoninus Pius	Chiragan	0.35	-2.64	2.65	508	1.9	58.5	Göktepe 3	99	58
55	Ra63	Head of Lucius Verus	Chiragan	0.6	-2.86	2.63	792	2.8	64.3	Göktepe 3	100	94
56	Ra66a	Cuirassed bust of Septimius Severus	Chiragan	0.4	-2.56	2.96	410	2.8	54.7	Göktepe 3	93	19
57	Ra119	Bust of young Caracalla	Chiragan	0.55	-2.47	2.89	344	2.7	54.5	Göktepe 3	81	5
58	Ra62	Bust of Geta	Chiragan	0.35	-2.74	2.96	775	1.5	56.4	Göktepe 3	100	57
59	Ra70	Male bust	Chiragan	0.4	-2.54	2.78	348	2.0	52.6	Göktepe 3	95	5
60	Ra65	Bust of a soldier	Chiragan	0.35	-2.53	2.83	500	3.0	56.4	Göktepe 3	97	59
61	Ra123	Bust of a male, naked	Chiragan	0.35	-2.62	2.83	371	3.2	58.3	Göktepe 3	81	11
62	Ra71	Male bust	Chiragan	0.65	-2.17	2.69	585	1.2	45.8	Göktepe 3	100	33
63	Ra73i	Male head	Chiragan	0.5	-2.93	2.53	648	2.7	51.6	Göktepe 3	99	98
64	Ra69	Male head	Chiragan	0.4	-2.46	2.75	419	3.6	49.8	Göktepe 3	84	26
65	Ra166	Small female bust, Tranquillina	Chiragan	0.45	-2.80	2.50	661	2.0	57.5	Göktepe 3	100	92
66	Ra103	Cuirassed bust	Chiragan	0.65	-1.85	2.50		4.6	60.6	Göktepe 3	83	68
67	Ra120b	Cuirassed bust of Septimius Severus	Chiragan	0.4	-2.17	2.69	570	2.4	55.4	Göktepe 3	100	62
68	--	Portrait of a boy <sup>iii</sup>	Chiragan	0.6	-2.86	2.59		5.78	58.7	Göktepe 3	92	88
69	--	Female bust <sup>iv</sup>	Chiragan	0.65	-2.83	2.55		1.6	51.6	Göktepe 3	99	94
70	Ra58c	Head of Trajan	Chiragan	0.4	-2.18	2.70		1.5	57.9	Göktepe 3	100	43
71	Ra73a	Bust of unbearded youth	Chiragan	0.3	-2.72	2.82	659	12.1	49.7	Göktepe 4	93	76
72	Ra73b	Bust of bearded youth	Chiragan	0.32	-2.64	2.82	368	10.0	53.6	Göktepe 4	98	43
73	Ra61a	Bust of young Marcus Aurelius	Chiragan	0.45	-2.54	2.89	375	4.5	52.6	Göktepe 4	54	10
74	Ra72	Bust of a soldier	Chiragan	0.55	-2.39	3.00	363	5.6	54.5	Göktepe 4	77	13
75	Ra167	Bust of a boy	Chiragan	0.35	-2.63	2.69	424	5.8	56.4	Göktepe 4	69	34
76	Ra74	Female bust	Chiragan	0.9	-2.09	2.53	448	7.2	49.6	Göktepe 4	78	41
77	Ra60 (2)	Headless bust, Antoninus Pius?	Chiragan	0.6	-2.75	2.56		14.7	46.4	Göktepe 4	98	98
78	Ra121	Cuirassed bust	Chiragan	0.6	-2.95	2.18	743	29.6	54.7	Göktepe 4	100	44
79	Ra165	Male bust	Chiragan	1.3	-3.06	5.48	214	6.0	57.6	Paros/Lychn	100	75
80	Ra57	Head of Augustus	Chiragan	1.1	-2.78	5.15	147	12.0	52.8	Paros/Lychn	100	82
81	Ra90	Head of Tiberius	Chiragan	1.1	-3.84	4.85	190	7.7	49.9	Paros/Lychn	100	94
82	Ra31	Head of Antonia Minor	Chiragan	0.9	-3.07	5.29	190	4.1	54.8	Paros/Lychn	100	71
83	Ra122	Head of Julio-Claudian prince	Chiragan	1.3	-2.71	4.53	173	10.5	49.9	Paros/Lychn	100	98
84	Ra76	Bust of Sabine	Chiragan	1	-2.68	4.97	152	6.9	46.8	Paros/Lychn	100	95

**ii** Analyses on the double samples mentioned in n. 19 indicate that the head and the torso of the Faun (inv. Ra131 and 2005.1.1, respectively) are both made of Göktepe marble. The same is true for the

head and bust of portrait no. 50, whereas the Göktepe heads nos. 58 and 78 are fit to Docimium busts. The former is white Docimium from the quarries of Altıntaş, whereas the latter is a clear example of

coloured Docimium (*pavonazetto*) from the quarries of Iscehisar.

**iii** Bergmann 1999, no. 9, 4.

**iv** Balty et al. 2012, 46 fig. 45.

No.	Museum Inventory	Description	Location	MGS mm	$\delta^{18}\text{O}$ ‰	$\delta^{13}\text{C}$ ‰	Sr ppm	EPR intensity %	EPR linewidth %	Provenance site	RP %	AP %
85	Ra58a	Head of Trajan	Chiragan	1.2	-2.89	4.92		5.6	55.2	Paros/Lychn	99	74
86	31.087	Aconii inscribed base	Chiragan	1.0	-2.75	4.01		15.1	62.2	Paros/Lychn	76	37
87	Ra58a (2)	Headless bust	Chiragan	0.7	-3.14	4.06		10.8	59.8	Paros/Lychn	87	21
88	Ra118	Bust of Commodus	Chiragan	1.7	-3.59	2.31		6.2	37.4	Paros II	37	31
89	Ra125	Bust of a boy	Chiragan	1.3	-4.40	1.39	86	14.2	40.4	Afyon	87	61
90	Ra61b	Bust of Marcus Aurelius	Chiragan	0.7	-4.42	0.98	45	46.6	45.8	Afyon	95	32
91	Ra66b	Bust of Septimius Severus crowned	Chiragan	0.55	-4.62	0.86	71	32.9	46.8	Afyon	87	100
92	Ra59	Bust of philosopher as a hero	Chiragan	0.9	-4.83	-0.41	103	18.2	40.0	Afyon	79	87
93	Ra73d	Male head	Chiragan	0.7	-4.88	1.14	42	47.4	42.8	Afyon	98	16
94	Ra34l	Male head, Maximian Herculeus?	Chiragan	1.6	-2.03	3.69		74.0	46.7	St B�at 1	98	85
95	Ra82	Female head	Chiragan	1.3	-2.00	3.69	236	57.2	50.9	St B�at 1	58	--
96	Ra 127	Female head, Valeria Maximilla?	Chiragan	0.8	-1.67	4.09		43.8	51.8	St B�at 1	77	20
97	Ra 93	Head of a youth, Maxentius?	Chiragan	1.2	-1.96	3.68		79.2	50.1	St B�at 1	95	79
98	Ra38	Female head, Valeria Eutropia?	Chiragan	0.9	-1.98	3.63		101.6	52.8	St B�at 1	86	42
99	Ra117	Bust of Trajan	Chiragan	1.0	-2.81	1.82	250	34.3	65.9	Carrara	91	28
100	2000.182.1	Head of a youth, Maxentius?	Chiragan	0.9	-2.30	1.95		137.5	64.5	Carrara	97	87
<b>Imperial portraits from B�eziers, 11 artefacts, 11 samples</b>												
1b	Ra340	Head of Livia	B�eziers	0.9	-3.03	5.12		4.9	59.5	Paros/Lychn	100	22
2b	Ra341	Head of Augustus	B�eziers	1.1	-2.73	5.44		5.0	45.6	Paros/Lychn	100	39
3b	Ra336	Head of Agrippa	B�eziers	1.1	-4.20	4.94		13.1	46.5	Paros/Lychn	87	35
4b	Ra338	Head of Iulia	B�eziers	1.1	-3.17	5.60		3.5	49.2	Paros/Lychn	100	31
5b	Ra342a	Head of Agrippa Postumus	B�eziers	1.05	-3.82	5.11		5.4	50.2	Paros/Lychn	99	56
6b	Ra339	Head of Antonia Minor	B�eziers	1.4	-3.43	5.25		4.2	47.5	Paros/Lychn	100	71
7b	Ra168 bis	Head of Agrippina	B�eziers	0.9	-3.59	5.13		4.1	47.1	Paros/Lychn	100	31
8b	Ra337	Head of Antoninus Pius	B�eziers	0.55	-2.05	1.89		56.8	60.4	Carrara	97	92
9b	Ra342d	Head of Drusus	B�eziers	0.45	-1.59	2.17		93.3	64.2	Carrara	99	72
10b	Ra342c	Head of Germanicus	B�eziers	0.6	-1.60	2.15		50.6	57.7	Carrara	96	91
11b	Ra342b	Head of Tiberius	B�eziers	0.65	-1.39	1.94		77.1	55.0	Carrara	96	75

Tab. 1 Analytical data and provenance results for 100 marble artefacts from Chiragan and 11 from B eziers tested at the Mus e St Raymond, Toulouse. The isotopic and EPR variables are given in ‰ or ‰ with respect to specific standards (Pee Dee Belemnite for isotopes and Dolomite N368 BCS for EPR). The strontium concentration is expressed in parts per million (ppm) and the maximum grain size (MGS) in mm. The relative (RP) and absolute (AP) probabilities are defined in this section »Analytical and Provenancing Techniques«. Within each group samples are listed according to the site of provenance

to calculate the most probable quarry of provenance of each unknown sample as a function of distance and probability parameters defined as follows:

- Distance. This is the distance of the data point under consideration from the centre of the ellipse that represents the probability field of a quarry. The central point of an ellipse expresses the average and hence the most characteristic values of a quarry. The closer the point is to the centre of an ellipse, the more likely it is to be made of that marble.
- Relative (posterior) probability. This is the probability that the sample belongs to some group within the assumption that it originates in any case from one of the groups in the selection. The threshold is 60 %. Low values indicate that the sample is in doubt between two or more groups.
- Absolute (typical) probability. This is a distance-dependent parameter measuring the absolute probability that the sample belongs to the chosen group or, in other words, is a typical representative of the group properties. The threshold is 10 %, corresponding to samples on the edge of the 90 % probability ellipse. Low values indicate anomalous samples (outliers) or samples that may not belong to any group in the selection.

The unknown samples are assigned to the most probable quarries and the results are considered to be reliable if the probability values are above their threshold limits. Graphical presentation using the experimental data as such (e. g. isotopic plots) or after statistical analysis (discriminant plots) are used to illustrate the results.

## Database and Marble Quarries

In most instances using the general marble database which includes all known quarry sites to establish the provenance of unknown samples is not necessary and may be too complex to obtain reliable results. A better approach is that of using a more or less extended set of quarries, which are selected as likely sources on the basis of historical and archaeological information and are compatible with the analytical properties of the samples under investigation. Only if this approach proves unsuccessful it may be necessary to go back to the complete database.

The white marbles sampled at Toulouse exhibit a wide range of different properties and for this reason several different sources were taken into account and include the following 12 marble sites corresponding to 18 marble groups<sup>23</sup>:

Italy: Carrara  
 France: St B at (2 groups)  
 Greece: Mt Hymettos, Mt Pentelicon, Paros (3 groups), Thasos (calcitic marbles)  
 Turkey: Afyon, Aphrodisias (urban quarries), Aphrodisias (Vakif quarries), Proconnesos (2 groups), Ephesos (2 groups), G ktepe (2 groups)

Most of the marble sites listed above are well known. They have been surveyed repeatedly and the geochemical properties of their marbles have been investigated using a number of analytical techniques<sup>24</sup>. As opposed to this the G ktepe, Aphrodisias Vakif and St B at sites are, for different reasons, less familiar and absent from most marble databases. Several years ago the quarries of Saint-B at were surveyed and studied in detail by Christine Costedoat<sup>25</sup>. The experimental data available, however, are not consistent with the data used in this work. For this reason new sampling of the site and new analyses were necessary in order to obtain an homogeneous set of quarry data. The results of this work and the less known sites of G ktepe and Aphrodisias Vakif are briefly presented in the next three sections.

In addition to the white marbles three black artefacts were also sampled at Toulouse including both *nero antico*/*bigio morato* stones (fisherman no. 37 inv. Ra46 and black vase no. 36, inv. Ra99) and *bigio antico* marbles (Isis no. 41, inv. Ra38[1])<sup>26</sup>. Their provenance was established using the same approach

**23** It is well known that several marble sites are not homogeneous and produce marble varieties which may differ considerably for one of more properties. In this case much better discrimination is obtained by splitting the site into more homogeneous marble groups which are often, but not always, topographically coherent.

**24** Extensive information on ancient marble sites and their geochemical properties can be found in the Proceed-

ings of the ASMOSIA Conferences that are regularly published since 1988.

**25** Costedoat 1992; Costedoat 1995.

**26** The names *nero antico*, *bigio morato*, and *bigio antico* do not provide any information concerning the provenance or the geochemical nature of the materials but are quite useful for describing their macroscopic appearance. *Bigio morato* and *nero antico* are rather similar dark grey to black stones which, owing to their

extremely fine-grained texture, attain a quasi-metallic shine after polishing. In contrast, *bigio antico* is a medium- to coarse-grained marble exhibiting different shades of grey and various mottled effects. It should be added that the *bigi antichi* are usually true marbles, whereas the *bigi morati* and *neri antichi* are mostly lime-stones. The *nero antico* marble of G ktepe, however, proves that this is not always the case.

described for the white analogues and a specifically tailored quarry database that has been discussed in detail elsewhere<sup>27</sup>.

### Göktepe Marble Site

The site, recently discovered near the village of Göktepe, approximately 40 km southwest of Aphrodisias, has been described and mapped in detail<sup>28</sup>. It produced high-quality black and white marbles exhibiting fine or extremely fine crystal grain and a compact and lustrous appearance. A highly characteristic, two-toned black and white stone was also quarried at Göktepe and used, especially in late antiquity, to obtain unusual colour effects. The ancient quarries are grouped into four different districts. Districts 1 and 2, to the north, produced mainly black or sometimes grey marble, whereas white statuary marble was quarried in districts 3 and 4. The bichrome blocks came primarily from the southern part of the site, district 4, where the black marble surfaces again. 21 sculptural white marble blocks dressed with a medium-large punch were found in one of the quarries. Two of the blocks bear quarry marks and one of them also features a carved circular cavity made to house a lead seal, as is frequently found in the blocks of the *Fossa Traiana* near Ostia<sup>29</sup> and in many other quarries known to have been part of the imperial patrimony. On this basis it has been suggested that also the quarries of Göktepe were, at least for part of their history, under imperial control. The total marble production at Göktepe has been estimated to be ca. 40 000 cubic metres corresponding to approximately 10 000 cubic metres of usable stone (efficiency around 25 %). Most of this material was white marble (80 %), the remaining being *nero antico* or *bigio morato* with small amounts of the two-toned stone<sup>30</sup>. As a comparison it may be recalled that the Ischehisar quarries, producing white and *pavonazzetto* marble, were estimated to be approximately ten times larger.

Extensive archaeometric work, partly unpublished, has been carried out in the quarries and on many sculptures mostly found in Italy and other western regions of the Empire. The results of this work are striking. More than 150 pieces made of white or black Göktepe marble widespread all over the Mediterranean have been identified so far<sup>31</sup>. Apart from a limited amount of black marble used to manufacture columns shafts and capitals all the finds are high quality sculptures often portraying members of the imperial family or patronized by the Emperor himself and including many famous masterpieces of ancient art. According to the sculptures identified so far the quarries were known and already active in the Augustan age at the beginning of the 1<sup>st</sup> century A.D.<sup>32</sup>. Extensive exploitation, however, started only in the Hadrianic age, at the beginning of the 2<sup>nd</sup> century A.D., and continued till late antiquity. On this basis Göktepe is certainly the most important among the new sites discovered so far in the region. Its use goes far beyond regional limits and, in fact, modifies considerably our knowledge of marble use and trade in antiquity.

### Vakif Marble Site

The quarries were discovered very recently on the eastern slopes of the Baba dağ approximately 25 km east of Aphrodisias and 8–10 km north of Vakifköy<sup>33</sup>. The site includes at least four large quarries with tall quarry fronts clearly testifying its size and importance. A few unfinished artefacts and the remains of a small building, which was probably used as a shelter by quarry workers,

27 Attanasio et al. 2013.

28 Attanasio et al. 2009; Attanasio et al. 2015a; Yavuz et al. 2011.

29 Pensabene et al. 2000.

30 Attanasio et al. 2009, 326–345.

31 Bruno et al. 2014.

32 Two double dionysiac Herms in the Palatine museum in Rome (inv. 614 and inv. 501) are thought to be of Augustan age and represent the earliest evidence of the sculptural use of white Göktepe (Bruno et al. 2014).

33 Bruno et al. 2012.



No.	Site, no. of samples	MGS mm	$\delta^{18}\text{O}$ ‰	$\delta^{13}\text{C}$ ‰	Sr ppm	EPR Intensity %	EPR Linewidth %
1	Carrara, 112	0.80 (0.2)	-1.89 (0.5)	2.11 (0.2)	163 (23)	68.5 (35)	63.4 (5)
2	Hymettos, 41	0.69 (0.2)	-2.17 (0.7)	2.20 (0.5)	162 (48)	14.2 (17)	46.0 (4)
3	Pentelicon, 154	0.96 (0.2)	-7.00 (1.2)	2.63 (0.4)	181 (18)	226.3 (170)	58.2 (9)
4	Afyon, Docimium, 65	0.86 (0.2)	-4.32 (1.4)	1.80 (1.1)	134 (43)	242.5 (146)	53.9 (8)
5	Aphrodisias city quarries, 103	2.12 (0.7)	-3.53 (0.8)	1.34 (1.1)	173 (99)	43.4 (58)	53.7 (9)
6	Aphrodisias Vakif, 26	1.31 (0.2)	-2.94 (0.9)	2.49 (0.4)	160 (28)	79.2 (43)	60.6 (6)
7	Thasos calcite, 76	3.8 (0.8)	-0.73 (1.2)	2.98 (0.4)	119 (22)	131 (97)	55.7 (4)
8	Paros 1, Lychnites, 41	1.7 (0.5)	-3.25 (0.4)	4.27 (0.7)	181 (52)	8.6 (4)	48.6 (4)
9	Paros 2, Chorodaki, 62	2.07 (0.5)	-1.11 (0.4)	1.79 (0.3)	128 (16)	19.5 (8)	47.9 (4)
10	Paros 2, Marathi, 28	2.11 (0.6)	-2.59 (0.6)	1.97 (0.8)	188 (19)	9.8 (9)	52.0 (4)
11	Proconnesos 1, 380	1.72 (0.5)	-2.08 (1.0)	2.65 (0.5)	194 (54)	6.0 (6)	0.578 (8)
12	Proconnesos 2, 14	1.68 (0.4)	-6.78 (1.2)	2.59 (0.3)	206 (38)	7.7 (13)	58.9 (9)
13	Ephesos 1, 88	1.74 (0.6)	-4.42 (1.4)	3.81 (0.7)	138 (20)	60.0 (66)	56.4 (6)
14	Ephesos 2, 38	1.72 (0.5)	-3.14 (0.4)	0.35 (0.6)	82 (8)	41.8 (12)	45.5 (5)
15	Göktepe 3, 45	0.64 (0.2)	-3.40 (0.9)	1.80 (1.6)	691 (174)	3.9 (2)	55.1 (4)
16	Göktepe 4, 18	0.68 (0.2)	-3.43 (1.3)	1.78 (1.3)	533 (155)	21.6 (8)	46.4 (4)
17	St Béat 1, 34	1.90 (0.6)	-2.31 (1.1)	3.39 (0.7)	--	69.5 (52)	51.3 (5)
18	St Béat 2, 23	1.57 (0.9)	-6.70 (1.8)	1.69 (1.2)	--	148.7 (88)	69.0 (16)

Tab. 2 Summary of the database used to provenance the white marble samples collected at Toulouse. Mean values, with standard deviations in parentheses, are given for the most important analytical variables. Units are as in Table 1

were found. The Vakif marble, generally white or sometimes greyish, is quite similar macroscopically and analytically to the marble of the Aphrodisias city quarries as shown by the data reported in Table 2. Despite the fact that discrimination between the two varieties can be occasionally uncertain the Vakif marble was certainly used at Aphrodisias for sculptural purposes. Also its use in architecture, although not tested, is quite likely. It should be pointed out that the Vakif site is probably just one example among several local sites that produced marbles very similar to the marble of the city quarries. It is now clear that marble activities at Aphrodisias led to the exploitation of a rather complex network of quarries producing different types of white and coloured marbles<sup>34</sup>.

### St Béat Marble Site

The quarries of St Béat, located on the northern slope of the central Pyrénées, are found on the two mountains called Montagne de Rié and Cap du Mont on the western and eastern sides of the homonymous village, respectively, and are separated by the valley of the Garonne river. The site extends over approximately 3 km<sup>2</sup> and is actively exploited at present mostly producing aggregates in huge underground quarries such as Lavigne, just north of St Béat on the eastern slope of the Montagne de Rié. In general the marbles of St Béat are

34 Bruno et al. 2012; Long 2012.

medium to coarse grained materials ranging in colour from pure white to greyish or bluish white. Much darker varieties similar to *bigio antico* as well as grey mottled and banded marbles are also found. The most characteristic features of the St Béat marbles, that often allows easy visual identification is the frequent presence of large translucent crystals easily visible against the homogeneous background generally medium grained and whiter.

The geology and geochemistry of the St Béat marbles were studied in detail by Christine Costedoat who extended the investigation to the marble quarried more to the west in the Bigorre region not far from Campan where the well known griotte de Campan or *cipollino mandolato* was extracted<sup>35</sup>. Unfortunately the isotopic, petrographic and cathodoluminescence analyses carried out by Costedoat on 83 quarry samples match only partly the analytical methods used in this work. No quantitative comparison is possible and therefore it was necessary to undertake a new sampling of the quarries to obtain analytical data comparable with already existing results. In total 57 samples were collected from Lavigne and Marignac, to the west of St Béat and from the quarries known as La Pene, Lez and Chateau on the eastern side of the village.

The results of the analyses are reported in detail in the Appendix Table 1. In agreement with Costedoat the marble of St Béat proved to be quite inhomogeneous exhibiting variable analytical results. The inhomogeneity, however, can be greatly reduced by classifying the samples into two different groups or varieties. The first group, called St Béat 1, includes the quarries of Lavigne, Marignac and Chateau, whereas the second variety, St Béat 2, refers to the quarries of La Pene and Lez. Previous results<sup>36</sup>, fully confirmed during this study, demonstrate, however, that most archaeological samples are, in fact, quite homogeneous and cluster right at the centre of the St Béat 1 group. The quarrying area exploited in antiquity seems to be much smaller than the modern site and limited to the areas around Lavigne and/or Chateau. Under these circumstances it will be seen in the following that analytical and statistical identification of the St Béat marble and discrimination with respect to the marbles quarried in the region of Aphrodisias is a relatively simple task.

## Results

### The St Béat Artefacts (36 Items)

Apart from the portraits, that being mostly imported from Rome are works produced under totally different circumstances and are discussed separately in the following, the results of Table 1 and the isotopic graph of Figure 9 clearly show that the local marble of St Béat was commonly used at Chiragan. This is true for a number of decorative and architectural elements tested in the Villa (nos. 25–30) but also and more importantly for all the Herakles' reliefs and the *dipei* that are commonly recognized as typical Aphrodisian works probably made by itinerant sculptors during the renovation of the Villa that took place at the end of the 3<sup>rd</sup> century A.D. according to Balty or in the second half of the 4<sup>th</sup> century according to Bergmann. Although the St Béat origin of the marble had been already suggested on macroscopic grounds, the fact that it is now unequivocally proven by scientific data prevents any further controversy.

In all cases the provenance is quite clear and unquestionable both analytically and graphically. In particular the isotopic graph shows that all samples cluster together at the centre of the St Béat 1 area outside the field spanned by the Aphrodisias city quarries and only marginally within the Vakif field. Even if

35 Costedoat 1992; Costedoat 1995.

36 Cabanot 1995; Immerzeel 1995.



St B at 1 is rather homogeneous by itself, the tight clustering of all the Chiragan artefacts strongly suggests that the marble was part of a single stock quarried on purpose from a specific area of the site for a single decoration programme.

The choice of the marble of St B at for the ›Aphrodisian‹ sculptures of Chiragan is somewhat surprising because previous data indicate that the Aphrodisian sculptors much preferred, whenever possible, to use their homeland marble which they were well acquainted to work. The most likely explanation of this incongruity is the fact that Chiragan is lying along the Garonne, a river that connects the region to the Atlantic but makes obviously difficult large scale import of marble from the Mediterranean. This is demonstrated also by the fact that famous coloured marbles such as *africano*, *giallo antico*, *cipollino* and others, are relatively common at Aix-en-Provence, Vienne, Lyon and other cities that are easily connected to the Mediterranean by the Rhone river but are virtually absent from the region of Toulouse, where they are replaced by local coloured stones<sup>37</sup>. Other artefacts made of St B at marble include the four portraits thought to represent the owner of the Villa and his family, identified by Balty with the emperor Maximian Herculeus, his son Maxentius, and their wives (nos. 94, 96, 97, and 98), dated, however, by Bergmann to the mid 2<sup>nd</sup> half of the 4<sup>th</sup> century A.D. The close relationship existing between these portraits and the group of Aphrodisian sculptures, pointed out by Balty<sup>38</sup> and Bergmann<sup>39</sup>, and the fact that the same St B at marble was used strongly suggest that these portraits were also made by Aphrodisian artists in the frame of the same decorative project. Balty stresses also the strong stylistic and technical similarity of a second fragmentary head of a youth shown in Figure 4 and tentatively identified as another portrait of Maxentius (no. 100, inv. 2000.182.1)<sup>40</sup>. This portrait, however, is made of Carrara marble and for this reason its tight association with the other four portraits is surprising. Since Balty's classification based on typology and workshop seems to be unquestionable a possible explanation is that the Aphrodisian sculptors might have used a discarded piece of Carrara marble, an hypothesis that makes this portrait even more interesting. An even later sculpture, the female portrait no. 95 (inv. Ra82; Fig. 6), is also made of white St B at marble. It is a sculpture of exceptional quality that has been dated to the end of the 4<sup>th</sup> or beginning of the 5<sup>th</sup> century A.D. The marble used proves that it was made locally perhaps by a sculptor of eastern origin as suggested by a combination of traditional and byzantine reminiscences. Although long considered not to originate from Chiragan, the female head no. 95 inv. Ra82 is now generally associated with the villa following the catalogue written by Alexandre du M ege who excavated at Chiragan in 1826–1830<sup>41</sup>. If this is true the sculpture demonstrates that even in this late period the owners of the villa could afford to buy artefacts of the highest quality.

Finally one black sculpture (black Isis no. 41, inv. Ra38[1]) was probably also made using local St B at marble. In the absence of detailed quarry data, however, the St B at identification of this artefact is tentative and is due to the relative analytical similarity with the white analogues and to the fact that no other known source appears to be compatible.

### The G ktepe Artefacts (44 Items)

The widespread presence of G ktepe marble at Chiragan is tightly connected with the large number of portraits that were imported from Rome. 37 of the 59 portraits analysed at Chiragan (63 %) turned out to be marble of G ktepe.

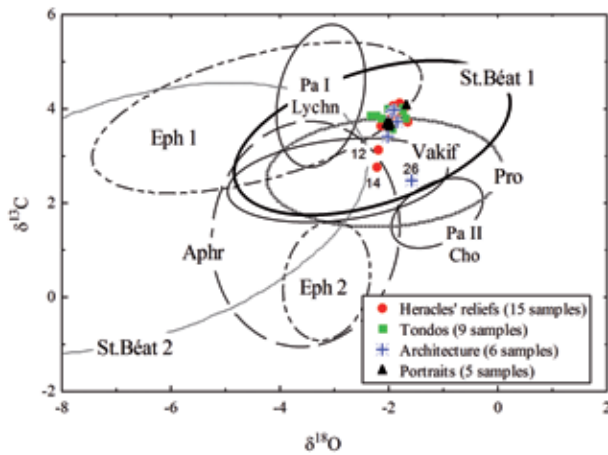
37 Bruno 2012.

38 Balty – Cazes 2008, 126–128.

39 Bergmann 1995, 198; Bergmann 1999, 32–35.

40 Balty – Cazes 2008, 91–93.

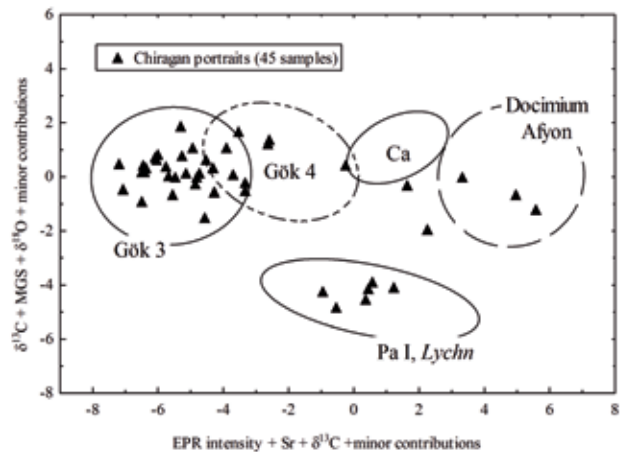
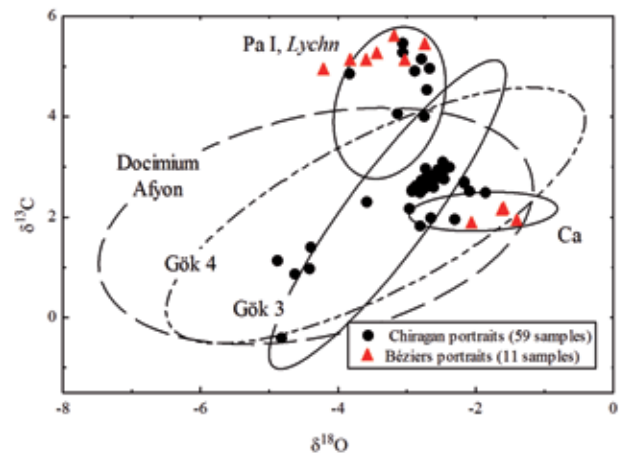
41 Stirling 2005, 60 f.



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Fig. 9 Isotopic graph of the 35 St B at white marble samples. Three samples slightly deviating from the core group are labelled. The architectural samples are nos. 25–30. The portraits are nos. 94 and 95–98. Quarry fields are represented by 90 % probability ellipses

Fig. 10 Isotopic (above) and statistical (below) graphs of the portraits tested at Toulouse (for the 5 St B at portraits see Fig. 9). The statistical graph includes a smaller number of portraits because strontium analyses were not always available



10

This result, although quite surprising and totally unexpected, is analytically unquestionable and is mostly due to a unique combination of fine grain size, high strontium and low manganese concentrations. The probability values of Table 1 and the graphs of Figure 10 do not leave any doubt on the provenance results. In the past most Chiragan portraits were considered to be Carrara marble on the basis of visual inspection or isotopic analyses and this hypothesis appeared to be perfectly coherent with the assumption that the sculptures had been imported from Rome. The misunderstanding is obviously due to the fact that the G ktepe quarries were unknown, but also to the macroscopic, petrographic and isotopic similarities that made it difficult or impossible to understand that an unknown marble of different origin had been used. Once again it is useful to point out that Carrara and G ktepe can be easily and reliably distinguished only using suitable analytical techniques, such as EPR spectroscopy or trace analysis. The consequence is that many Roman sculptures considered in the past to be Carrara would require careful re-examination.

Since we are dealing with imported sculptures, the extensive use of G ktepe for the Chiragan portraits is tightly connected with marble use in Rome, and does not reflect any special peculiarity of the villa or its owners. The problem should be explored in more detail also verifying differences and similarities between urban and provincial contexts. The question will be considered in some more detail in the next section.

More representative of the decorative taste of the owners of Chiragan are six small scale ideal sculptures already mentioned (Herakles no. 31, inv. Ra115;

Dionysos no. 32, inv. Ra134–137; Athena no. 33, inv. Ra113; Faun head no. 34, inv. Ra131; black fisherman no. 37, inv. Ra46; Asklepios no. 38, inv. Ra41), a fragmentary white marble vase (no. 35, inv. Ra181) and a fragmentary black vase (no. 36, inv. Ra99). The two Chiragan vases are strictly related with other examples in Aphrodisias and Rome both made of the same black marble<sup>42</sup>. Most of the artefacts just mentioned have been recognized as late antique Aphrodisian products dated to the mid or late 4<sup>th</sup> century A.D.<sup>43</sup>. The statuette of Asklepios, however, has been considered clearly earlier and probably the same is true also for Athena. Marble data indicate that the six late antique items are clear examples of white or black marble of Göktepe, whereas the Asklepios is made of Docimium marble from the Iscehisar quarries near Afyon and Athena is again an example of white Göktepe marble (Fig. 11). The limited amount of data does not allow to draw general conclusions. Nevertheless the results are interesting because they suggest, on one side, that clear relations between material, style and chronology do exist, but also demonstrate that the overall picture is complex and cannot be explained using a single, strictly unitary, model of production.

Ideal and mythological sculptures were commonly used in the decoration of Roman villas and continued to be popular in late antiquity. Several examples are known and include the Artemis of Cherchel (inv. S7)<sup>44</sup> dated, however, to the 2<sup>nd</sup> century, a group of statuettes including also a famous Artemis (Musée d'Aquitaine, Bordeaux, inv. 71.16.1) from the villa at Saint Georges de Montaigne<sup>45</sup>, a group of three statuettes now in the Skulpturensammlung at Dresden (Artemis, inv. Hm 270; Apollon, inv. Hm 250, and Demeter, inv. Hm 265)<sup>46</sup> and probably coming from Rome, the statuettes from Quinta das Longas<sup>47</sup>, Valdetorres de Jarama<sup>48</sup>, Silaharača<sup>49</sup>, and others. On a different scale the life-size Esquiline statues signed by the Aphrodisian sculptors Flavius Zenon and Flavius Chryseros and now at Copenhagen are certainly the most famous example of this late antique ideal sculpture used to decorate luxurious villas<sup>50</sup>. The crucial role played by Aphrodisian ateliers in this production, testified by epigraphic and stylistic evidence, is well established. Several questions, however, remain open including the possible contribution of different workshops, the chronology of the sculptures, that is, in fact, controversial in the case of the Esquiline group, and their place of manufacture. In this context the marble issue may provide crucial information, especially useful for ruling out hypotheses that are incompatible with the provenance of the stone.

There is now growing evidence that the marble of Göktepe, first introduced at Rome by Aphrodisian artists, rapidly met with great popularity and was later adopted by the most renowned urban ateliers for their top quality production. The consequence is that use of Göktepe is not by itself an unquestionable indication of Aphrodisian workmanship. The support of stylistic analysis is needed to which, however, marble information adds an important element of certainty. More importantly identification of Göktepe, in place of the Carrara marble often suggested in the past, implies that the assumption that the sculptures were made in Rome by Aphrodisian artists is no longer valid, at least on this basis. The true place of manufacture must be found, if possible, on different grounds.

Quite relevant in this context are the results reported very recently on the three statuettes in Dresden<sup>51</sup>. Marble analyses, based on petrographic and isotopic data, indicate provenance from Carrara and this information has been used to argue that the statuettes, typically Aphrodisian in style, were probably manufactured in Rome by an Aphrodisian workshop based in the capital. However, it is now clear that the analytical methods used for the Dresden

42 Both the black vases in Aphrodisias (excavation nos. 72–280) and in Rome (inv. 67269; Gasparri – Paris 2013, 358 f. cat. 261) were analysed and found to be *nero antico* marble from Göktepe.

43 Bergmann 1999, 68–70.

44 Landwehr 1993, 40 no. 26.

45 Bergmann 1999, 54.

46 Vorster 2012/2013.

47 Nogales Basarrate et al. 2004.

48 Puerta et al. 1994.

49 de Chaisemartin – Örgen 1984.

50 Moltesen 2000 dates the sculptures to the 2<sup>nd</sup> century A.D.

51 Vorster 2012/2013, 414.

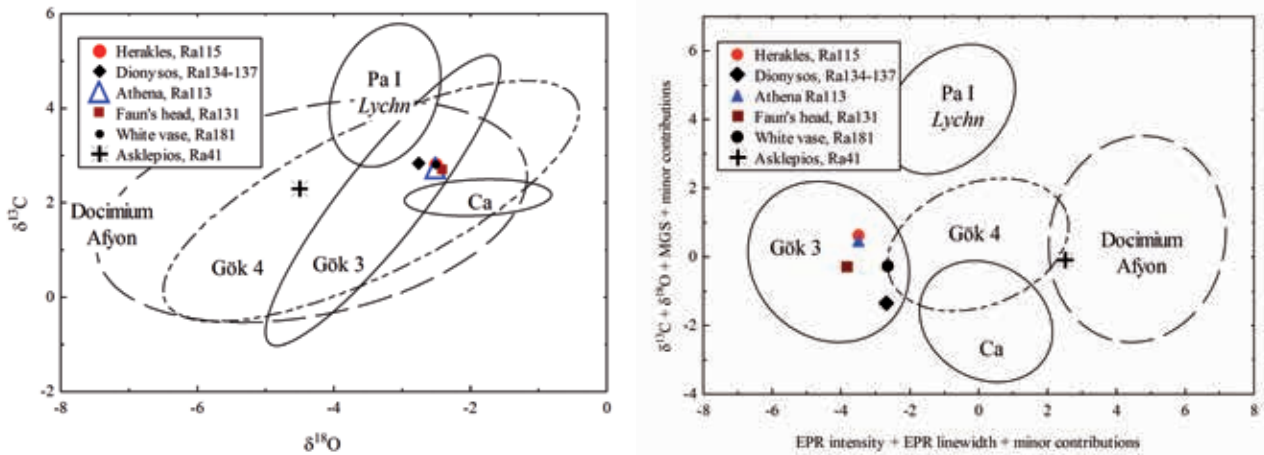


Fig. 11 Isotopic (left) and statistical (right) graphs of the 5 white marble statuettes and the white vase tested at Chiragan. The statistical graph does not use the strontium variable and therefore differs from the corresponding graph of Figure 10. The Docimium provenance of the marble of the statuette of Asklepios is clearly evident

statuettes may easily assign as Carrara marbles that, in fact, originate from Göktepe. The question is crucial and additional analyses would be desirable to obtain conclusive evidence on the marble provenance of the Dresden statuettes. The same problem has been met already with the Esquiline statues. Their marble identified long ago as Carrara on isotopic grounds<sup>52</sup> has been recently re-assigned as Göktepe using more extensive analyses<sup>53</sup>. As already noted the assumption, based on marble arguments, that the Esquiline statues were made in Rome must be dismissed and evidence on their place of manufacture must be found using different arguments.

As a matter of fact the increasing number of artefacts made using Göktepe or other Asiatic marbles seems to favour, in general, the export model at variance with the idea that the sculptures were manufactured in Rome or at their destination site. In any case the marble argument by itself does not solve the question because it is well possible that raw marble was exported to Rome and then carved. It should be added that marble transport from Göktepe was in any case a difficult task. Especially in the case of large scale sculptures bringing the marble to Aphrodisias and then exporting the finished product might have been, in fact, less efficient, more expensive, and more risky than simply exporting the raw marble. The presence at Rome of Göktepe marble blocks, although attested only in two instances<sup>54</sup>, provides support to this hypothesis. Once again it must be stressed that different models of production, though differently important, were probably adopted depending on a number of factors and that strictly unitary explanations of these phenomena are not possible.

#### Other Marble Varieties (20 items)

Other marbles identified at Chiragan include Paros (11 samples), Docimium (7 samples), and Carrara (2 samples). Most of the items in this group are portraits and therefore, as already stated, are discussed in the next section.

Artefacts that can actually be considered part of the villa decoration are the head of Aphrodite (no. 40, inv. Ra52, so-called Venus de Martres) made of parian *lychnites* (Paros I), the statuette of Asklepios (no. 38, inv. Ra41) already discussed, and the pilaster capital no. 39, inv. Ra25 made of Docimium marble from Iscehisar, Afyon. This latter is especially interesting. Stylistically it is virtually identical to several other examples that led Kramer to postulate the existence of a specialized late Roman workshop based at Docimium<sup>55</sup>. Many capitals of this type have been found in Greece, Syria, and Italy and demonstrate

52 Matthews – Walker 2000.

53 Attanasio et al. 2009; Attanasio et al. 2015b.

54 Besides the evidence already reported (Attanasio et al. 2012, 84) on the presence at Rome of black Göktepe marble, very recently a small shapeless block of white marble of Göktepe, probably from the nearby Fossa Traiana, has been discovered at Fiumicino, near Rome together with other white and coloured marble blocks.

55 Kramer 1994.

that, in spite of its tight association with Phrygia, the workshop or its products travelled widely<sup>56</sup>. Especially impressive is a large group of capitals coming from S. Maria Antiqua in the Roman Forum and dated to the late 3<sup>rd</sup> or early 4<sup>th</sup> century<sup>57</sup>. The new example found in Chiragan demonstrates that the workshop identified by Kramer was present also in the western regions of the Empire. Even if large scale trade of Mediterranean marbles could not reach this part of the Narbonensis, it turns out once again that import of small-sized finished artefacts such as the pilaster capital or the statuettes already mentioned was a relatively common practice at least in the case of luxurious residences and prestigious programmes of decoration.

### The Private and Imperial Portraits of Chiragan and Béziers (70 Items)

The results of the provenance study carried out on 59 portrait sculptures from Chiragan and 11 from Béziers (see Tab. 1 and Fig. 10) show clearly that only a limited number of marble varieties were used for this type of high quality sculpture commissioned by the Roman elite or the imperial family itself<sup>58</sup>. Approximately half of the portraits (37 samples, 53 %) are made of marble of Göktepe, that appears to be by far the dominant variety. Parian marbles, represented almost exclusively by *lychnites*, follow at great distance (17 samples, 24 %), whereas other marbles such as Carrara (6 samples, 9 %) or Docimium (5 samples, 7 %) play a rather marginal role or represent purely local phenomena, such as the five late portraits made on site using the marble of St Béat.

From an archaeometric point of view the results appear to be fully reliable: the possibility of Carrara/Göktepe discrimination has been already discussed and does not need additional scrutiny. The problem now is that of examining possible art-historical implications of a result that was quite unpredictable.

One point to be noted is that marble distribution does not change appreciably if private and imperial portraits are taken into account separately, whereas there is a striking difference between the portraits from Chiragan and those discovered at Béziers, where not a single example of Göktepe marble was found. Similarities and differences that may appear puzzling, however, become easily understandable in a diachronic perspective. To this purpose it is useful to exploit the provenance of imperial portraits, whose chronology is generally well known<sup>59</sup>.

With the exception of the colossal head of Antoninus Pius (no. 8b, inv. Ra337, Carrara marble) all other Béziers portraits belong to the Julio-Claudian period and were made using Parian *lychnites* (7 samples, 70 %) or Carrara marble (3 samples, 30 %). The dominant role of *lychnites* for manufacturing high-quality Julio-Claudian portraits, now verified at Béziers and previously in the case of the royal portraits of Cherchel<sup>60</sup>, is fully confirmed also at Chiragan, where five Julio-Claudian portraits were tested (samples nos. 79–83) and turned out to be all made of Parian *lychnites*.

Moving to later times relevant results were obtained testing the four heads of Trajan shown in Figure 12. Two of them (nos. 51 and 70) are marble of Göktepe and represent the earliest use of this marble at Chiragan, one (no. 85) is a Parian *lychnites* and the last one (no. 99) Luna marble from Carrara (Fig. 13). Previous results suggested that the marble of Göktepe, although sporadically used since the Augustan age<sup>61</sup>, became widespread at the beginning of the 2<sup>nd</sup> century A.D. during the Hadrianic age and in connection with the building of the Hadrian's Villa where the white and black varieties were extensively used<sup>62</sup>. These new data, as far as they are indicative of a general trend, slightly

56 Herrmann – Tykot 2009.

57 Kramer 1994, cat. 7–22 pls. 1–3.

58 The portraits discovered at Chiragan and Béziers are discussed together because in both cases we are in the presence of high quality artefacts mostly produced by the best sculptural ateliers in Rome and exported as finished products to be part of private or public spaces. As such they provide fully coherent information and contribute to describe the same phenomenon, that is the use of marble in the capital for manufacturing highly prized sculptural works.

59 At this preliminary stage of analysis the possible presence of re-carved artefacts is not taken into consideration.

60 Nine Julio-Claudian royal portraits including three portraits of Juba II, four portraits of Ptolemy, one portrait of Cleopatra Selene and one portrait of Drusilla were analysed at Cherchel and all found to be made of Parian *lychnites* (Landwehr et al. 2012/2013, 245 tab. 1).

61 See n. 32.

62 Attanasio et al. 2013.

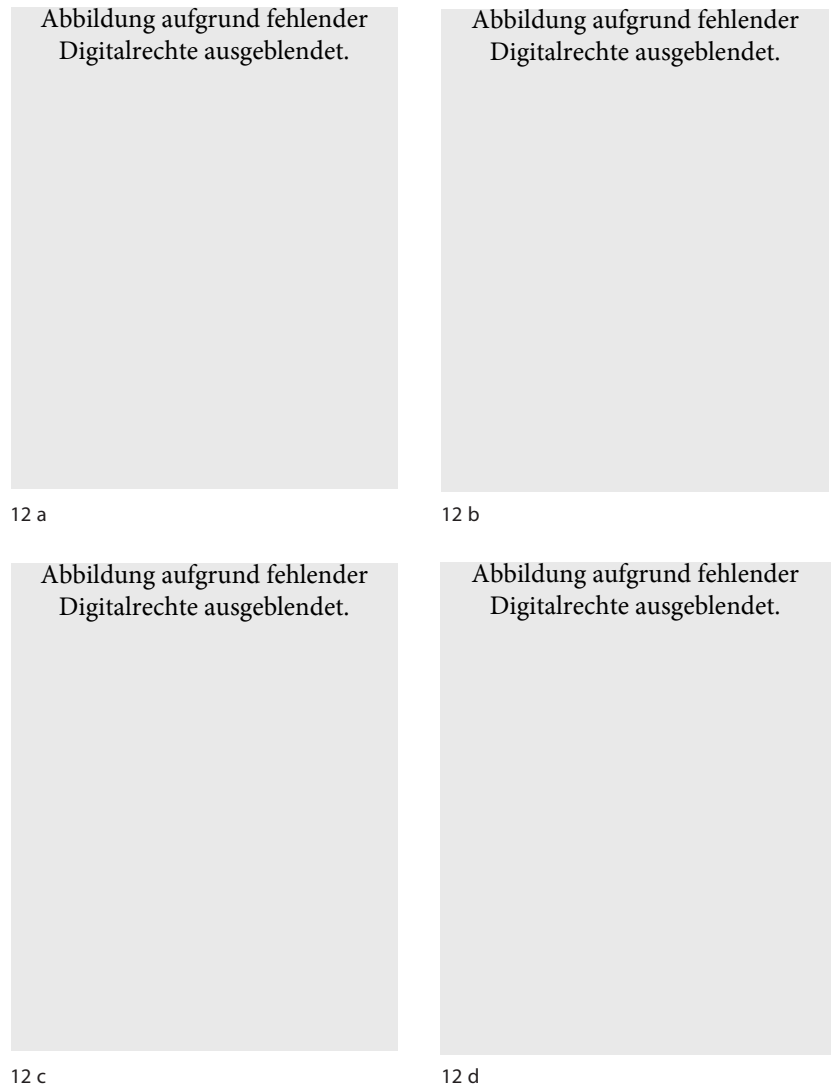


Fig. 12 Four Trajan's portraits from Chiragan, a: no. 85, inv. Ra58a, Parian *lychnites*; b: no. 51, inv. Ra58b, Göktepe; c: no. 70, inv. Ra58c, Göktepe; d: no. 99, inv. Ra117, Carrara. The headless bust no. 87, inv. Ra58a(2) probably joins with head Ra58a and is made of the same marble

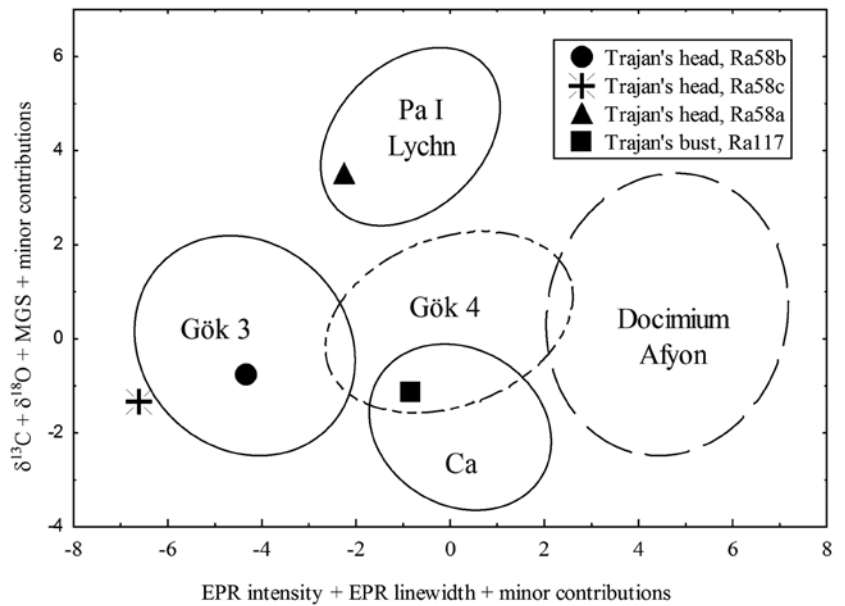


Fig. 13 Statistical graph of the four Trajan's portraits analysed in this study, drawn without using the strontium variable



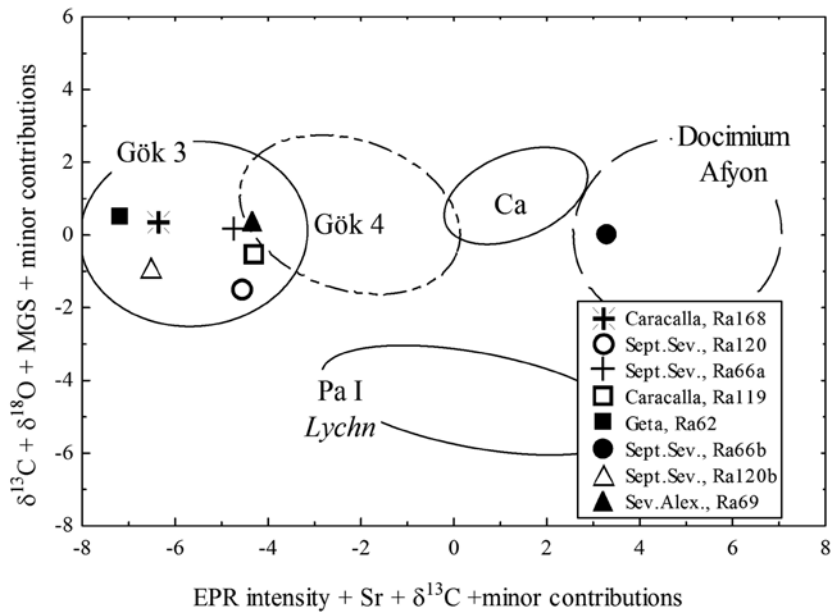


Fig. 14 Statistical graph of the eight Severan portraits analysed in this study: young Caracalla no. 45, inv. Ra168; Septimius Severus no. 46, inv. Ra120; Septimius Severus no. 56, inv. Ra66a; young Caracalla no. 57, inv. Ra119; Geta no. 58, inv. Ra62; Severus Alexander no. 64, inv. Ra69; Septimius Severus no. 67, inv. Ra120b; crowned Septimius Severus no. 91, inv. Ra66b

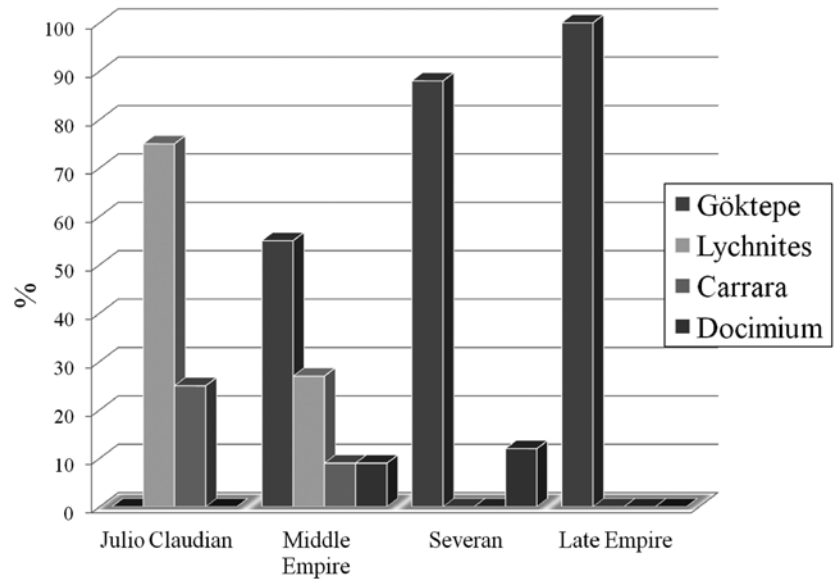
predate the introduction of the marble of Göktepe at Rome and demonstrate that already at the end of the 1<sup>st</sup> century A.D. it was used, together with other famous varieties, for the manufacture of imperial portraits.

In the mid 2<sup>nd</sup> century A.D., during the Antonine period, the marble of Göktepe apparently replaced almost completely the Greek and Italian varieties used till then. The six Antonine artefacts tested (nos. 54, 55, 73, 77, 88, and 90) include four Göktepe (67 %), one Paros (17 %), and one Docimium (17 %) portraits. During the Severan period and later the trend continued and grew larger. Seven of the eight Severan portraits analysed (nos. 45, 46, 56, 57, 58, 64, and 67) are Göktepe marble (88 %), whereas one (no. 91) is Docimium (12 %) as shown quite clearly by the graph of Figure 14. Four later portraits that can be dated to the mid 3<sup>rd</sup> century (nos. 42, 62, 65, and 76) are all marble of Göktepe, whereas the five portraits representing the family group of the villa owners (nos. 94, 96–98, and 100) that were made locally and are strictly associated with the so-called Aphrodisian sculptures (Herakles' reliefs and *tondos*) are predominantly made using the same St B at marble. They include, however, one unexpected example of Carrara marble (no. 100) that, as already noted, might be interpreted as the reworking of a different piece. It is worth recalling that the five portraits just mentioned are interpreted by Balty as the emperor Maximian Herculeius and his family and therefore dated to the Tetrarchic period, whereas Bergmann postdates the portraits and the other Aphrodisian sculptures to late 4<sup>th</sup> century A.D. The preliminary histogram of Figure 15, based on the 39 imperial portraits mentioned above and excluding the five portraits of the villa owners whose imperial attribution is controversial, provides a striking summary of the evolution of marble use just described.

It must be pointed out once again that the selection of portraits presented in this study, although representing a remarkable cross section of the best quality Roman portrait art, is certainly limited and needs to be greatly expanded both at Rome and in the provinces before drawing clear conclusions of general value.

A few points, however, can be stressed, even in the form of purely preliminary considerations or simple working hypotheses. The first and most unexpected result is that the Asiatic marble of Göktepe seems to be, on the whole, the most prized and widespread marble used for portrait sculpture. The history

Fig. 15 Histogram summarizing diachronic information of marble use for 39 imperial portraits analysed at Chiragan and Béziers. The label Middle Empire includes emperors from Trajan to Commodus. The label Late Empire include four portraits approximately dated to the mid 3<sup>rd</sup> century



of its use demonstrates that this marble started to meet large and increasing success between the end of the 1<sup>st</sup> and the beginning of the 2<sup>nd</sup> century A.D. and rapidly became the marble of choice for high quality portraiture, almost eclipsing Parian *lychnites* and other famous varieties. The reasons of this extraordinary success are certainly complex and need to be explored in detail. They are, however, intimately bound to the success met by the Aphrodisian sculptors who introduced the marble and apparently used it not only for its sculptural quality, but also as a trademark of workmanship in addition to their signatures.

A second point that is slowly coming to light is the strongly reduced role played by Carrara as a marble for high quality sculpture. The reliable identification of Göktepe, that is now possible, means, in fact, that many previous Carrara provenances, based on macroscopic inspection or incomplete analytical data, are wrong. In many instances, therefore, the hypothesis of manufacture in Rome is not supported by marble data. As already discussed the place of production must be identified, if possible, using different arguments. Of course extensive use of Asiatic marbles does not mean inevitably that the artefacts were made elsewhere and especially for the private or imperial portraits found in Rome production at destination still seems to be the most likely alternative. In any case the entire problem needs to be carefully reconsidered.

To conclude it is clear that the marble issue and the novel panorama of marbles used for sculpture, raise a number of important questions that deeply affect our knowledge of ancient sculpture and pose questions related to style, technical practices of marble carving and the way the artefacts were produced and traded. The basis of experimental data available at present, however, is still inadequate and must be considerably expanded before that more detailed and convincing analyses can be put forward.

## Conclusions

The results presented in this study seem to suggest that, in different ways and in different periods of time, most of the artefacts tested at Chiragan are linked to the city of Aphrodisias in terms of material (prevailing use of the marble of



Göktepe for the portraits and small scale statuary) or style (Herakles' reliefs, *tondos*, and portraits of the villa owners: all typical Aphrodisian sculptures made of St B at marble). The puzzling point is that only in a few instances, basically the late antique statuettes, the two aspects go together, whereas the G ktepe portraits do not seem to reveal any special Aphrodisian taste and, in turn, sculptures that are typically Aphrodisian use local rather than Asiatic marbles. This latter incongruity, however, is not difficult to understand. As a matter of fact bringing the large amount of marble that was needed to a region not connected to the Mediterranean was too difficult and expensive and probably for this reason the good quality local marble of St B at, very different from G ktepe, but relatively similar to the marble of the Aphrodisias city quarries, was used<sup>63</sup>.

Much more difficult is to understand whether or not the extensive use of G ktepe marble for the portraits may suggest any possible direct or indirect connection with the sculptors of Aphrodisias. The question leads us to the key problem that is understanding the reasons of the striking success met by this marble, a success that is made even clearer by recent studies on Roman imperial portraits<sup>64</sup>.

From this point of view Chiragan can be taken as an exemplary illustration of the great changes that occurred in Roman portrait art at the beginning of the 2<sup>nd</sup> century A.D. and that continued in later times<sup>65</sup>. In terms of material culture the phenomenon is represented by the replacement of Greek and Italian marbles, such as Parian *lychnites* and Luna marbles, with Asiatic varieties, mostly from G ktepe. Until recently this event went completely unnoticed not only because the G ktepe site was unknown, but also because the properties of its marbles made possible to mistake it as Carrara. Apparently a relatively sharp change took place between the end of the 1<sup>st</sup> century and the beginning of the 2<sup>nd</sup> century A.D. and was fostered by Aphrodisian sculptors who worked at the decoration of the Hadrian's villa. The phenomenon is especially clear in the case of portrait sculpture and becomes evident if the Julio-Claudian portraits of Chiragan and B ziers are compared with the Trajanic and later portraits tested at Chiragan. Since the portraits are unanimously considered to be import products from Rome, it is reasonable to assume that this aspect of marble use at Chiragan is indicative of what was happening in Rome.

A similar shift from west to east that led Proconnesos to replace Carrara as the most widespread architectural marble used in imperial times is well documented and has been largely ascribed to economic and logistic reasons<sup>66</sup>. In the case of sculptural marbles similar reasons are less likely, although a decrease of *lychnites* production may have contributed to the change. For several reasons, however, the G ktepe alternative appears surprising and is not obvious: the site is rather small and unfavourably located with the consequence that marble production was relatively limited and stone transport difficult and expensive. The excellent quality of the marble of course is important and certainly played quite an important role, still it does not seem able to explain by itself the extraordinary success met by this marble. Several alternatives existed and G ktepe does not seem to be so much superior in appearance and carving properties to the best qualities of Docimium or Luna marbles. In conclusion it may be argued that the crucial point was the tight connection existing between the marble of G ktepe and the Aphrodisian craftsmen who promoted its use and were the most prominent sculptors of their time owing to the stylistic and technical novelties that they introduced. Their signatures, that mention explicitly the ethnic of the artist, and the marble, that comes predominantly from G ktepe or sometimes from the city quarries of Aphrodisias, were used apparently to certify the Aphrodisian workmanship and to act in some way as

63 It has been already noted that famous coloured stones relatively common in cities located along the Rhone are virtually absent in the region of Toulouse where they were replaced by local varieties.

64 Attanasio et al. in print.

65 Smith 1998, 62; Smith 2006, 54.

66 Proconnesian marble, sporadically used in Roman architecture till the Flavian age, gradually replaced the use of Luna marble and virtually became by the end of the 2<sup>nd</sup> century A.D. the only white marble to be used in architecture at Rome and in the entire Mediterranean basin (Bruno et al. 2002; Attanasio et al. 2008). The reasons of this success were largely due to the huge production capacity of the quarries and to their convenient location that made possible easy sea transport. It should not be overlooked, however, that the introduction of Proconnesian marble was favoured and promoted also by the migration of sculptors and architects bringing new decorative designs from Asia Minor to Rome in late Hadrianic times.

a mark of origin. There are two likely, though hypothetical, consequences of the exceptional success met by the marble of Göktepe. The first is that its use, at least for fine sculpture, became ubiquitous and probably extended to the most renowned urban ateliers whether or not they had Aphrodisian origins or connections. The second consequence stems directly from the first: it is difficult to believe that the sculptors in Rome borrowed from the Aphrodisians only the marble without inheriting, at least partly, their technical and stylistic peculiarities.

In other words it may be suggested that the use of the marble of Göktepe went far beyond Aphrodisian workmanship keeping trace, however, of the stylistic and technical peculiarities that had been introduced by the Carian sculptors. The implicit consequence is that the sculptors of Aphrodisias, directly or indirectly, played a role much more important than thought so far in determining the trends of Roman portrait art in imperial times.

The fame of Aphrodisian sculptors and their marbles was long lasting and they continued to be popular well into late antiquity. Production of portraits and honorific statues or, alternatively, refurbishment of older sculptures has been documented at Aphrodisias at least till the end of the 5<sup>th</sup> century<sup>67</sup>. In the west the most famous example are certainly the Esquiline sculptures, also made of Göktepe marble. Whether they are 4<sup>th</sup> century products or older 2<sup>nd</sup> century sculptures, the fact that they were signed and sold in the 4<sup>th</sup> century shows clearly that the fame of Aphrodisias in late antiquity was not fading. Asiatic workshops, mostly Aphrodisian, played a dominant role in the decoration of the new capital of the east. Their style, that Bergmann calls »Aphrodisias Constantinople«<sup>68</sup>, became even more prized and the elites in various parts of the Empire were eager to rival with the new capital and to have their residences decorated by the same craftsmen.

On this basis it seems not difficult to understand why when Chiragan was refurbished, perhaps in the late 4<sup>th</sup> century as suggested by Bergmann, the most ambitious parts of the decoration programme was entrusted to the sculptors of Aphrodisias. As already noted, however, the good quality local marble of St Béat had to be used for logistic reasons. Smaller objects easier to transport had been imported earlier as finished products, as demonstrated by the Docimium Asklepios no. 38, inv. Ra41 and probably also by the Göktepe Athena no. 33, inv. Ra113, and continued to be imported in late antiquity as demonstrated by the other Göktepe statuettes and also by the Docimium pilaster capital no. 39, inv. Ra25 all artefacts dated to the mid or late 4<sup>th</sup> century<sup>69</sup>.

To conclude it may be stated that these results seem to confirm the relationship between workmanship and marble already noted in previous works: whenever possible the sculptors of Aphrodisias used their own marbles from Göktepe or from the city quarries, turning to different varieties only when this became virtually impossible. The reverse statement, that is the possibility of recognizing direct or indirect Aphrodisian reminiscences in the portraits on the basis of the marble used, although attractive, remains at present largely tentative. Much more extensive provenancing work as well as more detailed stylistic analyses specifically oriented to explore this problem will be necessary in order to verify this working hypothesis. The novel and unexpected panorama of marble use that is emerging, however, seems to suggest that this work is worth doing and may deepen our understanding of ancient Roman art.

67 Smith 1999.

68 Bergmann 2002.

69 Bergmann 1999, 68–71.

No.	Sample label	Quarry	Group	MGS mm	$\delta^{18}\text{O}$ ‰	$\delta^{13}\text{C}$ ‰	EPR Intensity %	EPR Linewidth %	Colour %	EPR Dolom %
1	Lav1	Lavigne	SB1	1.7	-2.17	3.82	46.3	49.6	211	0
2	Lav2	Lavigne	SB1	2	-1.78	3.91	28.7	47.5	197	0
3	Lav3	Lavigne	SB1	2	-1.96	3.87	60.7	46.5	177	0
4	Lav4	Lavigne	SB1	2.8	-1.70	1.81	67.7	51.4	233	0
5	Lav5	Lavigne	SB1	1.75	-2.02	3.77	44.1	51.4	137	0
6	Lav6	Lavigne	SB1	2	-7.03	1.37	19.3	38.5	186	0
7	Lav7	Lavigne	SB1	2.8	-1.95	3.47	70.7	51.3	146	0
8	Lav8	Lavigne	SB1	2.5	-1.94	3.70	23.4	48.4	185	0
9	Lav9	Lavigne	SB1	2	-1.79	3.96	21.1	47.5	158	0
10	Lav10	Lavigne	SB1	1.6	-2.28	3.80	43.8	47.7	166	0
11	Lav11	Lavigne	SB1	1.7	-1.26	3.55	59.9	64.3	174	0
12	SLP1	Upper Lavigne	SB1	2	-2.13	2.07	136.0	57.3	87	0
13	SLP2	Upper Lavigne	SB1	2.2	-1.44	3.43	201.7	60.2	174	0
14	SLP3	Upper Lavigne	SB1	1.7	-1.88	2.02	120.5	56.3	165	0
15	SLP4	Upper Lavigne	SB1	2.2	-2.32	2.06	79.6	54.3	145	0
16	SLP5	Upper Lavigne	SB1	1.4	-1.42	3.41	203.2	60.4	210	0
17	SLR1	Upper Lavigne	SB1	1.7	-5.07	3.35	165.1	52.1	175	0
18	SLR2	Upper Lavigne	SB1	2.2	-2.08	3.89	78.9	52.1	232	0
19	SLR3	Upper Lavigne	SB1	1.6	-2.02	4.00	79.1	50.3	224	0
20	SLR4	Upper Lavigne	SB1	1.6	-2.53	3.89	115.6	54.3	201	0
21	SLR5	Upper Lavigne	SB1	3.2	-3.63	3.54	66.5	46.2	188	0
22	LP1	La Pene	SB2	0.33	-5.68	2.34	178.4	77.8	216	100
23	LP2	La Pene	SB2	0.15	-5.93	2.20	242.3	88.9	235	78
24	LP3	La Pene	SB2	0.05	-6.33	2.07	234.7	76.1	226	85
25	LP4	La Pene	SB2	0.05	-5.68	2.22	225.3	74.6	241	93
26	LP5	La Pene	SB2	0.1	-5.91	2.35	106.7	71.3	210	100
27	LP6	La Pene	SB2	1.6	-11.48	0.57	108.3	49.5	152	0
28	LP7	La Pene	SB2	0.9	-5.80	2.40	91.8	73.0	234	100
29	LP8	La Pene	SB2	0.8	-7.27	1.65	47.1	50.8	228	60
30	LZ1.1	Lez 1	SB2	1.3	-6.79	1.38	107.2	74.2	183	1
31	LZ1.2	Lez 1	SB2	1.1	-9.70	-0.64	69.6	47.3	173	0
32	LZ1.3	Lez 1	SB2	0.8	-5.21	1.02	89.3	51.9	44	0
33	LZ1.4	Lez 1	SB2	1.05	-8.20	-1.15	57.2	48.1	153	0
34	LZ1.5	Lez 1	SB2	1.3	-5.31	0.51	76.2	76.5	155	0
35	LZ1.6	Lez 1	SB2	0.9	-5.50	0.63	139.9	59.6	157	0
36	LZ1.7	Lez 1	SB2	0.65	-11.44	1.56	160.0	50.1	209	0
37	LZ1.8	Lez 1	SB2	1.3	-6.32	3.72	426.4	95.4	206	1
38	LZ1.9	Lez 1	SB2	2.5	-5.57	0.38	149.6	57.7	58	0
39	LZ2.1	Lez 2	SB2	1.05	-6.68	1.92	216.9	85.3	204	76
40	LZ2.2	Lez 2	SB2	1.7	-6.09	2.25	157.9	85.3	234	1
41	LZ2.3	Lez 2	SB2	1.2	-5.96	2.25	177.6	83.4	220	1
42	LZ2.4	Lez 2	SB2	1.7	-5.57	2.58	239.1	91.6	226	1
43	LZ2.5	Lez 2	SB2	1.1	-6.30	3.48	60.2	64.2	179	22
44	LZ2.6	Lez 2	SB2	1.75	-5.41	3.08	58.9	55.1	182	0
45	Cast1	Chateau	SB2	2.5	-2.38	3.49	27.4	48.0	134	0
46	Cast2	Chateau	SB2	1.4	-1.99	3.36	23.2	47.0	141	0
47	Cast3	Chateau	SB2	1.3	-1.51	3.79	31.8	45.3	212	0
48	Cast4	Chateau	SB2	1.1	-1.48	4.10	28.5	50.9	168	0
49	Cast5	Chateau	SB2	1.6	-1.54	4.11	19.8	47.0	163	0
50	Cast6	Chateau	SB2	2	-1.53	4.08	20.5	48.0	182	0
51	Cast7	Chateau	SB2	2.8	-2.04	3.25	10.8	48.0	183	0
52	Cast8	Chateau	SB2	2.8	-1.76	3.84	20.9	51.8	173	0
53	MRC1	Marignac	SB2	1.05	-2.75	3.75	100.3	51.1	88	0
54	MRC2	Marignac	SB2	1.3	-2.65	3.30	70.9	54.2	30	0
55	MRC3	Marignac	SB2	1.7	-2.77	3.23	61.3	55.6	63	0
56	MRC4	Marignac	SB2	1.3	-3.05	2.72	81.6	54.2	53	0
57	MRC5	Marignac	SB2	1.05	-2.61	3.42	133.7	55.1	44	0

App. 1 Database of the St B at marble quarries including 57 marble samples from seven different quarries. The label Upper Lavigne indicates samples from ancient walls and marble debris above Lavigne. The content of dolomite as measured by EPR, although not used for discrimination, has been included to provide more complete information on the marbles. Units are as in Table 1. Detailed data concerning other quarries present in the database selection have been already published

No.	Museum Inventory	Former inventory	Joulin 1901 plate no.	Esperandieu 1907 and 1908 volume no.	Description
1	Ra28a	30.373	IX-111B	02-899.02	Herakles as beardless youth
2	Ra28b	30.374	VIII-90B	02-899.07	Herakles and the Lernean Hydra
3	Ra28c	30.378	IX-103B, IX-117B	02-899.06	Herakles and the Cretan Bull
4	Ra28d	30.375	VIII-93B	02-899.09	Herakles and the Erymanthian Boar
5	Ra28e	30.379		02-899.06	Herakles and Cerberus
6	Ra28f	30.383	IX-119A	02-899.04	Herakles in the garden of the Hesperides
7	Ra28g	30.377	VIII-94B	02-899.10	Herakles and the Stymphalian birds
8	Ra28h	30.381	VIII-96B, D	02-899.05	Herakles and Hippolyte
9	Ra28i	30.380	IX-104B, D	02-899.03	Herakles and Diomedes
10	Ra28j	30.376	IX-101B	02-899.01	Herakles cleaning the Augean stables
11	Ra28k	30.384	IX-112B	02-899.04	Bearded Herakles
12	Ra28l	30.382	IX-110B	02-899.08	Herakles and Geryon
13	Ra30	30.302	IX-113B	02-916	Fragmentary Athena
14	Ra139c				Fragmentary relief, bull's foot
15	2000.311.9				Fragmentary relief
16	Ra34d	30.503	VI-55B, VI-61B	02-892.03	Hephaestus
17	Ra34f	30.505	VI-52B	02-892.05	Aphrodite
18	Ra34h	30.507	VI-49B	02-892.01	Artemis
19	Ra34i	30.508	VI-50B	02-892.02	Cybele
20	Ra34j	30.509	VI-51B	02-892.11	Athena
21	Ra34k	30.510	VI-57B	02-892, 10	Hygieia
22	Ra34l	30.511	VI-58B	02-892.04	Attis
23	Ra34m	30.512	VI-56B	02-892.12	Asclepius
24	Ra51bis	30.327	VII-72B	02-901	Hera
25	Ra23a	30.561			Decorated pillar
26	Ra23d	30.564			Decorated pillar
27	Ra50bis	30.325	IX-114B	02-895.02	Relief with head
28	Ra95	30.152			Fragment of a relief with male head
29	Ra17bis	30.946			Capital
30	Ra222a	30.073		02-869	Frieze with arms
31	Ra115	30.342	XI-138D	02-893	Herakles, statuette
32	Ra134-137	30.348	XII-160E, XI-155E	02-919, 935	Dionysos, statuette
33	Ra113	30.340	X-136D	02-907	Athena, statuette
34	Ra131	30.345	XII-169E	02-940	Head of faun
35	RA181				White vase
36	Ra 99				Black vase
37	Ra46	30.316	XIV-200B	02-952	Black statuette of fisherman
38	Ra41	30.311	XI-144B	02-912	Asklepios, statuette
39	Ra25	30.568			Pilaster capital
40	Ra52	30.328	X-121B	02-902	Head of Aphrodite
41	Ra38(1)	30.307	XIII-177B	02-927	Black Isis
42	Ra73h	30.128	XXII-296B	02-1003	Head of Philip II the younger
43	Ra73g	30.127	XXII-297B	02-980	Male head
44	Ra73f	30.126	XIX-275B	02-951	Head of a partly bald male
45	Ra168	30.171	XXIII-304E	02-999	Head of young Caracalla
46	Ra120	30.157	XXII-294D	02-963	Head of Septimius Severus
47	RA126	30.164	XXI-288D	02-991	Head of child
48	RA78	30.135	XXI-286B, XXI-287B	02-985	Female head
49	RA79	30.136	XXI-290B	02-990	Female head
50	RA124	30.162	XVIII-273D	02-988	Bust of a child
51	Ra58b	30.103	XVII-261D	02-958	Head of Trajan
52	RA77	30.134	XXI-289B	02.989	Female bust
53	RA73e	30.125	XXIII-302B	02-978	Cuirassed male bust
54	Ra60(1)	30.106	XIX-276B	02.962	Head of Antoninus Pius
55	Ra63	30.110		02-987	Head of Lucius Verus
56	Ra66a	30.113	XXIII-299B	02-981	Cuirassed bust of Septimius Severus
57	Ra119	30.156	XIX-280D	02-996	Bust of young Caracalla
58	Ra62	30.109	XXI-291B	02-1011	Bust of Geta
59	Ra70	30.118	XXIV-306B	02-982	Male bust
60	Ra65	30.112	XXIV-308A	02-970	Bust of a soldier

No.	Museum Inventory	Former inventory	Joulin 1901 plate no.	Esperandieu 1907 and 1908 volume no.	Description
61	Ra123	30.161	XVIII-269D	02-972	Bust of a male, naked
62	Ra71	30.119	XXV-327B	02-977	Male bust
63	Ra73i	30.129	XXIV-309B	02-994	Male head
64	Ra69	30.117	XXIV-313E	02-974	Male head
65	Ra166	30.169	XXII-298E, XXIII-305E	02-1001	Small female bust, Tranquillina
66	Ra103				Cuirassed bust
67	Ra120b	30.158			Cuirassed bust of S. Severus
68	--				Portrait of a boy <sup>i</sup>
69	--				Female bust <sup>ii</sup>
70	Ra58c	30.104			Head of Trajan
71	Ra73a	30.121	XVI-258B	02-998	Bust of unbearded youth
72	Ra73b	30.122	XVII-265B	02-986	Bust of bearded youth
73	Ra61a	30.107	XX-282B	02.960	Bust of young Marcus Aurelius
74	Ra72	30.120	XXIV-310B	02-983	Bust of a soldier
75	Ra167	30.170	XVIII-274E	02-997	Bust of a boy
76	Ra74	30.131	XXV-314B	02-993	Female bust
77	Ra60(2)				Headless bust, Antoninus Pius?
78	Ra121	30.159	XXIII-303E, XXV315D	02-967	Cuirassed bust
79	Ra165	30.168	XVII-263E	02-973	Male bust
80	Ra57	30.101	XVI-255B	02-948	Head of Augustus
81	Ra90	30.145		02-1012	Head of Tiberius
82	Ra31	30.303	VII-73B		Head of Antonia Minor
83	Ra122	30.160	XVIII-268D	02-957	Head of Julio-Claudian prince
84	Ra76	30.133	XIX-278B	02-992	Bust of Sabine
85	Ra58a				Head of Trajan
86		31.087	XXIV-307E		Aconii inscribed base
87	Ra58a(2)				Headless bust
88	Ra118	30.155	XX-283D	02-965	Bust of Commodus
89	Ra125	30.163	XVIII-272D	02-1006	Bust of a boy
90	Ra61b	30.108	XX-281B	02-961	Bust of Marcus Aurelius
91	Ra66b	30.114	XXII-293B	02-976	Bust of Septimius Severus crowned
92	Ra59	30.105	XVIII-266B	02-969	Bust of philosopher as a hero
93	Ra73d	30.124		02-1021	Male head
94	Ra34l	30.511	VI-60B	02-892	Male head, Maximian Herculius?
95	Ra82	30.139		02-1030	Female head
96	Ra 127	30.165	XXIII-301D	02-1004	Female head, Valeria Maximilla?
97	Ra 93	30.148	XXV-328B		Head of a youth, Maxentius?
98	Ra38	30.308	XIII-177B	02-927	Female head, Valeria Eutropia?
99	Ra117	30.154	XVII-261D	02-956	Bust of Trajan
100	2000.182.1		XXV-320D		Head of a youth, Maxentius?
1b	Ra340	30.006		01-528.5	Head of Livia
2b	Ra341	30.007		01-528.7	Head of Augustus
3b	Ra336	30.002		01-528.1	Head of Agrippa
4b	Ra338	30.004		01-528.3	Head of Iulia
5b	Ra342a	30.008		01-528.6	Head of Agrippa Postumus
6b	Ra339	30.005		01-528.4	Head of Antonia Minor
7b	Ra168 bis	30.172		02-1010	Head of Agrippina
8b	Ra337	30.003		01-528.10	Head of Antoninus Pius
9b	Ra342d	30.011		01-528.9	Head of Drusus
10b	Ra342c	30.010		01-528.8	Head of Germanicus
11b	Ra342b	30.009		01-528.2	Head of Tiberius

<sup>i</sup> Bergmann 1999, no. 9, 4.

<sup>ii</sup> Balty et al. 2012, 46 fig. 45.

## Abstract

Donato Attanasio – Matthias Bruno – Walter Prochaska, The Marbles of the Roman Villa of Chiragan at Martres-Tolosane (Gallia Narbonensis)

### Keywords

Chiragan • Aphrodisian sculptors • marble provenance • isotopes • trace analysis • EPR

100 marble artefacts originating from the Roman villa of Chiragan and now part of the collections of the Musée Saint-Raymond at Toulouse were analysed and include the Herakles reliefs, the mythological tondos, a series of small-scale ideal sculptures and the collection of private and imperial portraits present in the villa. The local marble of St B at quarried on the Pyrenees was used for the Herakles reliefs, the tondos, and the coeval portraits of the owner of Chiragan and his family, all sculptures stylistically identified as works of Aphrodisian sculptors dated to the end of the 3<sup>rd</sup> century A.D. by Jean-Charles Balty or to the mid second half of the 4<sup>th</sup> century A.D. by Marianne Bergmann. Import marbles, mostly Asiatic from G ktepe and Iscehisar (Docimium), were used for nine small-scale artefacts probably imported as finished products. Quite unexpected is the pervasive use of the marble of G ktepe for portraits of the Roman imperial period that were mostly imported from Rome as finished products. 59 sculptures from Chiragan and 11 portraits discovered at B ziers in the 19<sup>th</sup> century were analysed (G ktepe 37, Paros 17, Docimium 5, St B at 5, Carrara 6). Between the end of the 1<sup>st</sup> and the beginning of the 2<sup>nd</sup> century A.D. the marble of G ktepe rapidly replaced Parian *lychnites* as the sculptural marble of choice for high quality portraits. In late antiquity, marble use and workmanship at Chiragan were deeply affected by the wish to emulate urban models, but also met with the difficulty of importing foreign marbles to a region not easily reachable from the Mediterranean.

### Sources of illustrations

Figs. 1–8. 12 a. c: D. Attanasio – M. Bruno – W. Prochaska, with permission of the Musée Saint-Raymond at Toulouse • Figs. 9–11. 13–15: D. Attanasio – M. Bruno – W. Prochaska • Figs. 12 b. d: J. F. Peir ,   Clich  J. F. Peir , Musée Saint-Raymond, Mus e des Antiques de Toulouse, published with permission of J. F. Peir 



**Abbreviations**

- Attanasio 2003 • D. Attanasio, *Ancient White Marbles: Analysis and Identification by Paramagnetic Resonance Spectroscopy* (Rome 2003)
- Attanasio et al. 2006 • D. Attanasio – M. Brilli – N. Ogle, *The Isotopic Signature of Classical Marbles* (Rome 2006)
- Attanasio et al. 2008 • D. Attanasio – M. Brilli – M. Bruno, *The Properties and Identification of Marble from Proconnesos (Marmara Island, Turkey): A New Database Including Isotopic, EPR and Petrographic Data*, *Archaeometry* 50, 2008, 747–774
- Attanasio et al. 2009 • D. Attanasio – M. Bruno – A. B. Yavuz, *Quarries in the Region of Aphrodisias: The Black and White Marbles of Göktepe (Muğla, Turkey)*, *JRA* 22, 2009, 312–348
- Attanasio et al. 2012 • D. Attanasio – M. Bruno – W. Prochaska – A. B. Yavuz, *Aphrodisian Marble from the Göktepe Quarries: The Little Barbarians, Roman Copies from the Attalid Dedication in Athens*, *BSR* 80, 2012, 65–87
- Attanasio et al. 2013 • D. Attanasio – M. Bruno – W. Prochaska – A. B. Yavuz, *The Asiatic Marbles of the Hadrian's Villa at Tivoli*, *JASc* 40, 2013, 4358–4368
- Attanasio et al. 2015a • D. Attanasio – M. Bruno – W. Prochaska – A. B. Yavuz, *A Multi-Method Database of the Black and White Marbles of Göktepe Including Isotopic, EPR, Trace and Petrographic Data*, *Archaeometry* 57, 2015, 217–245
- Attanasio et al. 2015b • D. Attanasio – M. Bruno – W. Prochaska – A. B. Yavuz, *Re-evaluation of the Marble Provenance of the Esquiline Group Sculptures (Ny Carlsberg Glyptotek, Copenhagen) Following the Discovery of the Aphrodisian Marble Quarries at Göktepe*, *RM* 121, 2015, 567–589
- Attanasio et al. in print • D. Attanasio – M. Bruno – W. Prochaska – A. B. Yavuz, *The Marble of Roman Imperial Portraits*, in: *Interdisciplinary Studies on Ancient Stone. Proceedings of the Eleventh International Conference of the Association for the Study of Marble and Other Stones in Antiquity (ASMOSIA) Split 18–23 May 2015*, *ASMOSIA* 11 (in print)
- Balty – Cazes 1995 • J. C. Balty – D. Cazes, *Portraits impériaux de Béziers (Toulouse 1995)*
- Balty – Cazes 2005 • J. C. Balty – D. Cazes, *Sculptures antiques de Chiragan I. Les portraits romains I.1 Époque julio-claudienne (Toulouse 2005)*
- Balty – Cazes 2008 • J. C. Balty – D. Cazes, *Sculptures antiques de Chiragan I. Les portraits romains I.5 La Tétrarchie (Toulouse 2008)*
- Balty et al. 2012 • J. C. Balty – D. Cazes – E. Rosso, *Sculptures antiques de Chiragan I. Les portraits romains I.2 Le siècle des Antonins (Toulouse 2012)*
- Bergmann 1995 • M. Bergmann, *Un ensemble de sculptures de la ville romaine de Chiragan: Oeuvre de sculpteurs d'Asie Mineure, en marbre de Saint-Beat?*, in: J. Cabanot – R. Sablayrolles – J. L. Schenck (eds.), *Les marbres blancs des Pyrénées: Approches scientifiques et historiques (Saint-Bertrand-de-Comminges 1995)* 197–206
- Bergmann 1999 • M. Bergmann, *Chiragan, Aphrodisias, Konstantinopel: Zur mythologischen Skulptur der Spätantike*, *Palilia* 7 (Wiesbaden 1999)
- Bergmann 2000 • M. Bergmann, *La villa di Chiragan*, in: S. Ensoli – E. La Rocca (eds.), *Aurea Roma: Dalla città pagana alla città cristiana. Exhibition Catalogue Rome (Rome 2000)* 168–171
- Bergmann 2007 • M. Bergmann, *Die kaiserzeitlichen Porträts der Villa von Chiragan: Spätantike Sammlung oder gewachsenes Ensemble?*, in: F. A. Bauer – Ch. Witschel (eds.), *Statuen in der Spätantike, Spätantike – frühes Christentum – Byzanz. Kunst im ersten Jahrtausend. Reihe B. Studien und Perspektiven* 23 (Wiesbaden 2007) 323–339
- Bruno 2012 • M. Bruno, *On the Use and Distribution of the White and Black Aphrodisian Göktepe Marbles, Étude des marbres des sculptures antiques. Table ronde du Musée Saint-Raymond de Toulouse 7 novembre 2012*, <[http://saintraymond.toulouse.fr/Etude-des-marbres-des-sculptures-antiques\\_a276.html](http://saintraymond.toulouse.fr/Etude-des-marbres-des-sculptures-antiques_a276.html)> (26.07.2016)
- Bruno et al. 2002 • M. Bruno – S. Cancelliere – L. Conti – P. Pensabene – L. Lazzarini – P. Pallante – B. Turi, *Provenance and Distribution of White Marbles in Temples and Public Buildings of Imperial Rome*, in: J. J. Herrmann Jr – N. Herz – R. Newman (eds.), *Interdisciplinary Studies on Ancient Stone. Proceedings of the Fifth International Conference of the Association for the Study of Marble and Other Stones in Antiquity (ASMOSIA) Boston, June 1998*, *ASMOSIA* 5 (London 2002) 289–301
- Bruno et al. 2014 • M. Bruno – D. Attanasio – W. Prochaska – A. B. Yavuz, *An Update on the Use and Distribution of White and Black Göktepe Marbles from the First Century AD to Late Antiquity*, in: P. Pensabene – E. Gasparini (eds.), *Interdisciplinary Studies on Ancient Stone. Proceedings of the Tenth International Conference of the Association for the Study of Marble and Other Stones in Antiquity (ASMOSIA) Rome, 21–26 May 2012*, *ASMOSIA* 10 (Rome 2014) 461–468

- Bruno et al. 2012 • M. Bruno – H. Elçi – A. B. Yavuz – D. Attanasio, Unknown Ancient Marble Quarries of Western Asia Minor, in: A. Gutierrez – P. Lapuente – I. Rodà (eds.), *Interdisciplinary Studies on Ancient Stone. Proceedings of the Ninth International Conference of the Association for the Study of Marble and Other Stones in Antiquity (ASMOSIA)* Tarragona, Spain, June 8–13, 2009, ASMOSIA 9 (Tarragona 2012) 562–572
- Cabanot 1995 • J. Cabanot, Les chapiteaux de marbre antérieurs à l'époque romane de la région d'Aquitaine: Matériau et typologie, in: J. Cabanot – R. Sablayrolles – J. L. Schenck (eds.), *Les marbres blancs des Pyrénées: Approches scientifiques et historiques* (Saint-Bertrand-de-Comminges 1995) 223–260
- Cazes 2005 • D. Cazes, Histoire d'une collection: De la naissance du Musée des Antiques de Toulouse aux portraits julio-claudiens de Chiragan, in: Balty – Cazes 2005, 9–69
- Cazes – Ugaglia 1999 • D. Cazes – E. Ugaglia, Le Musée Saint-Raymond. Musée des Antiques de Toulouse (Toulouse 1999)
- Costedoat 1992 • Ch. Costedoat, Essai de caractérisation des marbres blancs pyrénéens par des méthodes physiques. Application en architecture et en archéologie (Ph.D thesis University Bordeaux 1992)
- Costedoat 1995 • Ch. Costedoat, Recherches sur les marbres pyrénéens, in: J. Cabanot – R. Sablayrolles – J. L. Schenck (eds.), *Les marbres blancs des Pyrénées: Approches scientifiques et historiques* (Saint-Bertrand-de-Comminges 1995) 101–118
- de Chaisemartin – Örgen 1984 • N. de Chaisemartin – E. Örgen, *Les documents sculptés de Silahatarağa* (Paris 1984)
- Eck 2000 • W. Eck, Sugli Aconii e sul loro legame con Roma, in: S. Ensoli – E. La Rocca (eds.), *Aurea Roma: Dalla città pagana alla città cristiana. Exhibition Catalogue Rome* (Rome 2000) 172 f.
- Ésperandieu 1907 • É. Ésperandieu, *Recueil général des bas-reliefs, statues et bustes de la Gaule romaine I* (Paris 1907)
- Ésperandieu 1908 • É. Ésperandieu, *Recueil général des bas-reliefs, statues et bustes de la Gaule romaine II* (Paris 1908)
- Gasparri – Paris 2013 • C. Gasparri – R. Paris (eds.), *Palazzo Massimo alle Terme, le Collezioni* (Rome 2013)
- Hannestad 1994 • N. Hannestad, *Tradition in Late Antique Sculpture. Conservation, Modernization, Production* (Aarhus 1994)
- Hannestad 2007 • N. Hannestad, Late Antique Mythological Sculpture – In Search of a Chronology, in: F. A. Bauer – Ch. Witschel (eds.), *Statuen in der Spätantike, Spätantike – frühes Christentum – Byzanz. Kunst im ersten Jahrtausend. Reihe B. Studien und Perspektiven 23* (Wiesbaden 2007) 273–305
- Herrmann – Tykot 2009 • J. J. Herrmann jr. – R. H. Tykot, Some Products from the Dokimeion Quarries: Craters, Tables, Capitals, and Statues, in: Y. Maniatis (ed.), *Interdisciplinary Studies on Ancient Stone. Proceedings of the Seventh International Conference of the Association for the Study of Marble and Other Stones in Antiquity (ASMOSIA)* Thassos, 15–20 September 2003, ASMOSIA 7, BCH Suppl. 51 (Athens 2009) 59–75
- Immerzeel 1995 • M. Immerzeel, L'emploi du marbre pyrénéen pour la production de sarcophagus paléochrétiens en Gaule: La Provence et les Pyrénées, in: J. Cabanot – R. Sablayrolles – J. L. Schenck (eds.), *Les marbres blancs des Pyrénées: Approches scientifiques et historiques* (Saint-Bertrand-de-Comminges 1995) 207–222
- Joulin 1901 • L. Joulin, Les établissements gallo-romains de la Plaine de Martres-Tolosane, *Mémoires présentés par divers savants à l'Académie des inscriptions et belles-lettres de l'Institut de France* 11, 1901, 219–300
- Kiilerich 2011 • B. Kiilerich, Private Portraits in Late Antiquity: Observing the Subject, in: F. D'Andria – I. Romeo (eds.), *Roman Sculpture in Asia Minor*, JRA Suppl. 80 (Portsmouth 2011) 359–370
- Kramer 1994 • J. Kramer, *Korinthische Pilasterkapitelle in Kleinasien und Konstantinopel*, IstMitt Suppl. 39 (Tübingen 1994)
- Landwehr 1993 • Ch. Landwehr, *Die römischen Skulpturen von Caesarea Mauretaniae I. Idealplastik* (Berlin 1993)
- Landwehr et al. 2012/2013 • Ch. Landwehr – D. Attanasio – M. Bruno – R. Sobott, The Sculptural Marbles of Caesarea Mauretaniae (Cherchel, Algeria), *Jdi* 127/128, 2012/2013, 227–260
- Long 2012 • L. E. Long, Regional Marble Quarries, in: Ch. Rattè – P. D. De Staebler (eds.), *The Aphrodisias Regional Survey, Aphrodisias 5* (Darmstadt 2012) 165–202



- Matthews – Walker 1990 • K. Matthews – S. Walker, Report on the Stable Isotope Analysis of the Marble of the Esquiline Group of Sculptures at the Ny Carlsberg Glyptotek, Copenhagen, in: C. Roueché – K. T. Erim (eds.), *Aphrodisias Papers. Recent Work on Architecture and Sculpture: Including the Papers Given at the Second International Aphrodisias Colloquium Held at King's College London on 14 November, 1987*, JRA Suppl. 1 (Ann Arbor 1990) 147–151
- du Mège 1835 • A. du Mege, *Description du Musée des Antiques de Toulouse* (Paris 1835)
- Moltesen 2000 • M. Moltesen, The Esquiline Group: Aphrodisian Statues in the Ny Carlsberg Glyptotek, *AntPl* 27, 2000, 111–131
- Nogales Basarrate et al. 2004 • T. Nogales Basarrate – A. Carvalho – M. J. Almeida, El programa decorativo da la Quinta das Longas (Elvas, Portugal): Un modelo excepcional de las Uillas de la Lusitania, in: T. Nogales Basarrate – L. J. Gonçalves (eds.), *Actas de la IV Reunión sobre Escultura Romana en Hispania* (Madrid 2004) 103–156
- Pensabene 2011 • P. Pensabene, Su alcuni aspetti produttivi delle «scuole» di scultura di Docimio, Afrodisia e Nicomedia, in: F. D'Andria – I. Romeo (eds.), *Roman Sculpture in Asia Minor*, JRA Suppl. 80 (Portsmouth 2011) 37–61
- Pensabene 2013 • P. Pensabene, *I marmi nella Roma antica* (Rome 2013)
- Pensabene et al. 2000 • P. Pensabene – L. Lazzarini – M. Soligo – M. Bruno – B. Turi, The Parian Marble Blocks of the Fossa Traiana, in: D. U. Schilardi – D. Katsonopoulou (eds.), *Paria Lithos: Parian Quarries, Marble and Workshops of Sculpture. Proceedings of the First International Conference on the Archaeology of Paros and the Cyclades Paros 2–5 October 1997*, *Archaiologikes kai Istorikes Meletes* 1 (Athens 2000) 527–536
- Prochaska 2013 • W. Prochaska, A Sculptural Marble of Prime Quality in Antiquity: The Dolomitic Marble of the Sivec Mountains in Macedonia, *Archaeometry* 55, 2013, 179–197
- Prochaska – Grillo 2010 • W. Prochaska – S. M. Grillo, A New Method for the Determination of the Provenance of White Marbles by Chemical Analysis of Inclusion Fluids: The Marbles of the Mausoleum of Belevi/Turkey, *Archaeometry* 52, 2010, 59–82
- Puerta et al. 1994 • C. Puerta – M. A. Elvira – T. Artigas, La Colección de Esculturas Hallada en Valdetorres de Jarama, *Archivo Español de Arqueología* 67, 1994, 179–200
- Sada 1996 • P. Sada (ed.), *Lo sguardo di Roma: Ritratti delle province occidentali dell'Impero Romano dai Musei di Mérida, Toulouse e Tarragona* (Rome 1996)
- Smith 1998 • R. R. R. Smith, Cultural Choice and Political Identity in Honorific Portrait Statues in the Greek East in the Second Century AD, *JRS* 88, 1998, 56–93
- Smith 1999 • R. R. R. Smith, Late Antique Portraits in a Public Context: Honorific Statuary at Aphrodisias in Caria, A.D. 300–600, *JRS* 89, 1999, 155–189
- Smith 2006 • R. R. R. Smith, *Aphrodisias II. Roman Portrait Statuary from Aphrodisias* (Mainz 2006)
- Stirling 2005 • L. Stirling, The Learned Collector. Mythological Statuettes and Classical Taste in Late Antique Gaul (*Ann Arbor* 2005)
- Stirling 2007 • L. Stirling, Statuary Collecting and Display in the Late Antique Villas of Gaul and Spain, in: F. A. Bauer – Ch. Witschel (eds.), *Statuen in der Spätantike, Spätantike – frühes Christentum – Byzanz. Kunst im ersten Jahrtausend. Reihe B. Studien und Perspektiven* 23 (Wiesbaden 2007) 307–321
- Vorster 2012/2013 • Ch. Vorster, Spätantike Bildhauerwerkstätten in Rom. Beobachtungen zur Idealskulptur der nachkonstantinischen Zeit, *JdI* 127/128, 2012/2013, 393–498
- Yavuz et al. 2011 • A. B. Yavuz – D. Attanasio – H. Elçi – M. Brilli – M. Bruno, Discovery and Preliminary Investigation of the Göktepe Marble Quarries (Muğla, Turkey): An Alternative Source of Aphrodisias Marbles, in: P. Jockey (ed.), *Leukos lithos: Marbres et autres roches de la Méditerranée antique. Interdisciplinary Studies on Ancient Stone. Proceedings of the Eighth International Conference of the Association for the Study of Marble and Other Stones in Antiquity (ASMOSIA) Aix-en-Provence, France, June 12–18, 2006*, *ASMOSIA* 8 (Paris 2011) 93–109

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