



## Article

# Marble Architectural Elements and Liturgical Furniture of the Santa Giustina Basilica in Padova: New Archaeometric Data on the Importation of Proconnesian Marble in the Late Antique Adriatic

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**Abstract:** This paper examines eight marble samples from the architectural elements and liturgical furniture of the ecclesiastical complex of Santa Giustina in Padova (Italy), founded by the *Rufus Venantius Opilio* before AD 524. The provenance determination of the marbles was carried out by means of a multi-analytical approach combining mineralogical–petrographic investigations, performed by microscopic observations of thin sections, and the measurement of the ratios of stable carbon and oxygen isotopes. The results obtained were compared with up-to-date petrographic and isotopic databases (Antonelli and Lazzarini 2015), and they showed that the analyzed marbles come from the quarries of the island of Proconnesus in Asia Minor, modern Marmara Adası (Turkey). Archaeometric evidence, together with the stylistic and functional analysis of the pieces, suggests the direct importation of a complete set of sculptures, shipped at different stages of workmanship from the workshops of Constantinople and expressly ordered by a single patron, who can be identified as *Opilio*, founder of the basilica of Santa Giustina and praetorian prefect at the court of King Theodoric.

**Keywords:** Padova; basilica of Santa Giustina; architectural and liturgical furnishings; Proconnesian marble; 6th century AD



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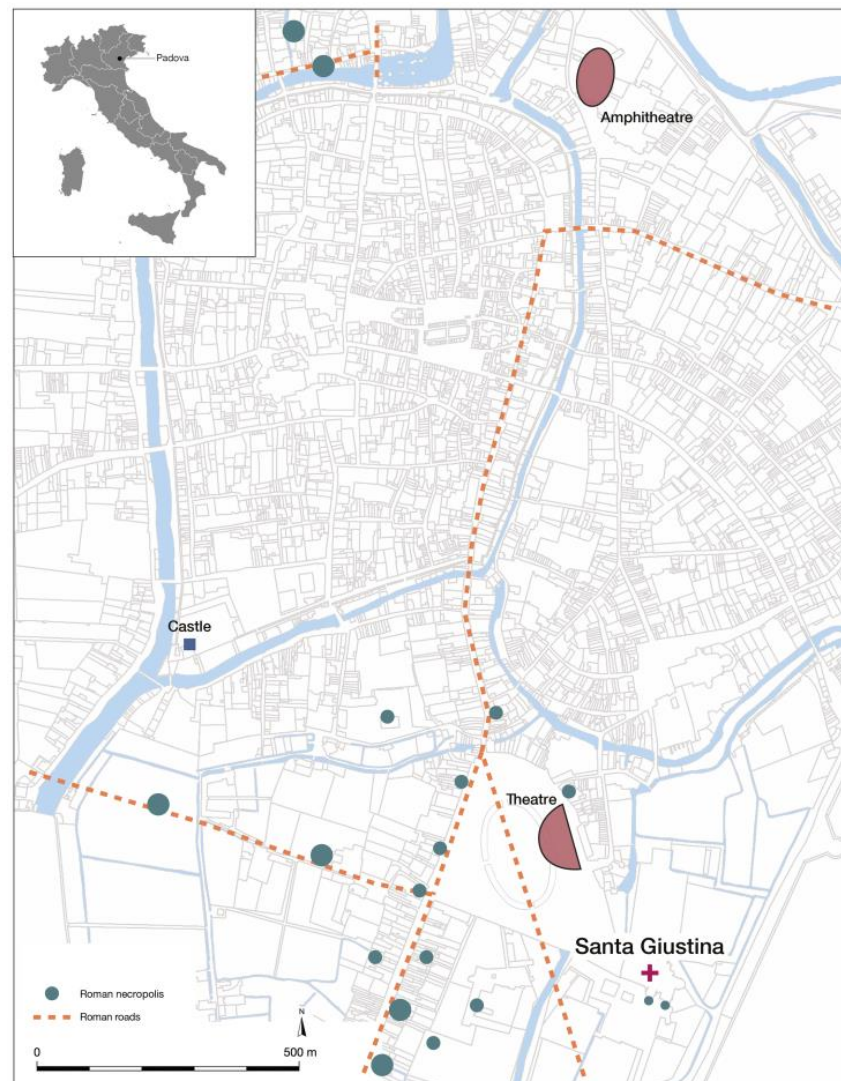
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## 1. Introduction

The remains of the basilica of Santa Giustina, which was built in the suburbs of the Roman city of Padova in the 6th century AD and was to become a key ecclesiastical monument throughout the Middle Ages, have been the subject of numerous investigations by historians, art historians, and archaeologists since the 1930s [1,2] (Figure 1). However, many issues still need to be clarified, mainly concerning the archaeological context of its foundation, the function and chronology of the surviving structures, and the plan of the late antique complex. With the aim of answering these questions, the University of Padova has carried out a series of multidisciplinary research projects on this monument to examine the stratigraphic sequence of the architectural remains [3], to re-examine old excavation records [4], and to carry out dating of the ancient mortars [5] and archaeometric characterization of the bricks [6,7].

The current study focuses on the architectural elements and liturgical furnishings, reporting the results of provenance identification of the white marbles used for the late antique sculptures preserved at the basilica of Santa Giustina.

Eight marble samples were macroscopically described and investigated by means of the mineralogical and petrographic observations of thin sections and the stable isotope ratio analysis of carbon and oxygen.

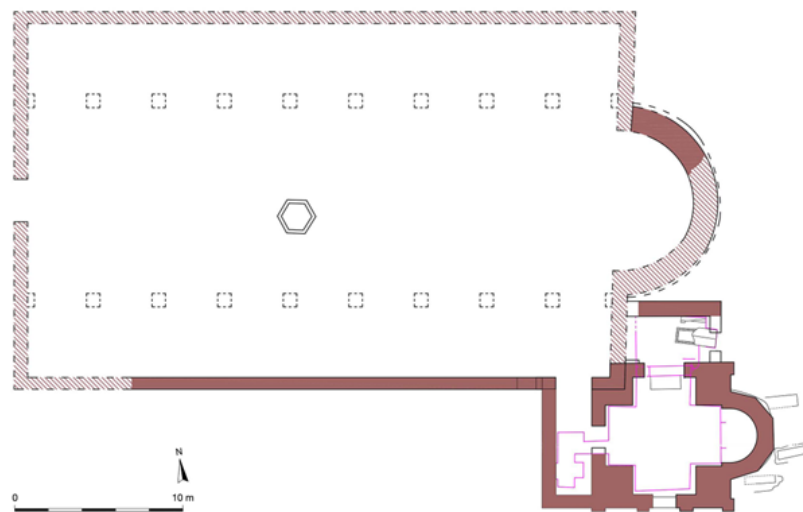


**Figure 1.** Map of Padova showing the location of the basilica of Santa Giustina.

#### *The Late Antique Basilica of Santa Giustina*

The basilica of Santa Giustina was founded in the southeastern suburbs of Padova by *Rufus Venantius Opilio*, praetorian prefect under the Ostrogothic king Theodoric, in the early 6th century AD, as attested by the dedicatory inscription now preserved in the oratory of San Prosdocimo. The late antique church, largely destroyed by an earthquake in 1117, was later rebuilt in a more modest form, as attested by medieval chronicles [8], and was reconstructed in its present form in the 16th century. Only parts of the 6th-century ecclesiastical complex survive today (Figure 2): (a) the oratory of San Prosdocimo, originally dedicated to the Virgin, annexed to the southeastern corner of the church; (b) the foundations of the apse of the main nave, brought to light by excavations in 2007; (c) two in situ mosaics and other fragments belonging to the church floor and walls; and (d) a group of 30 marble reliefs belonging to the liturgical and architectural furnishings.

The main preserved part of the building is the oratory, built in a cross-in-square plan, with an apse on the east side, a pentagonal exterior and semi-circular interior, and a rectangular atrium to the west connecting to the church. The plan and decorative apparatus of this oratory are very similar to those of the oratory of Santa Maria *Mater Domini* in Vicenza, annexed to the southeastern corner of the funerary basilica of Santi Felice e Fortunato, which was founded by the Ostrogothic referendary *Gregorius* in the first half of the 6th century AD [9].



**Figure 2.** Hypothetical plan of the late antique ecclesiastical complex of Santa Giustina; the red color indicates surviving structures.

The prestige of the late antique basilica of Santa Giustina is clear from the use of huge quantities of marble for the architectural and liturgical furnishings, as described in medieval manuscripts. For example, in the 12th century the author of the *Inventio* of San Daniele, describing the church before the Romanesque reconstruction, records that the naves were separated by marble columns and the internal walls were largely covered with marble slabs. Marble also covered the walls of the oratory of San Prosdocimo up to the impost of the dome arches [8]. Some centuries later, in 1564, the chancellor Gian Giacomo Terenzio writes that the altars dedicated to the Virgin and Saint Prosdocimo were separated by four small marble columns surmounted by an architrave with an inscription [10], identifiable as the chancel barrier now placed to close the apse of the oratory of San Prosdocimo.

Only a few elements of these marble furnishings survive, largely located in the oratory of San Prosdocimo, and today decontextualized from their original location (Figure 3). Based on their function, we can distinguish three chancel screen panels, five piers, four pier colonnettes supporting an architrave with an inscription, one *cymatium*, and one triangular door lintel with an inscription.



**Figure 3.** Marble reliefs belonging to the liturgical and architectural furnishings of the late antique basilica of Santa Giustina.

Some architectural elements also survive, such as seven fragmentary molded cornices and one panel belonging to the original marble cladding of the sacellum, replaced in the 1950s with slabs of Lasa marble (South Tyrol, Italy) to imitate the antique ones [11]. On a slab of uncertain function is a portrait of a young man, identified in an inscription as Saint Prosdocimo, the first bishop of Padua, according to the 11th-century hagiographical account of his life [12].

## 2. Materials and Methods

### 2.1. The Marble Artefacts Examined

Typological and stylistic analysis of the sculptures was combined with archaeometric analyses of specific samples, aimed at identifying the origin of the white marbles. The samples were taken from eight stone artefacts which were representative of the different functional categories identified (Figure 4).



**Figure 4.** The marble artefacts studied.

SG\_24. Triangular lintel with a dedicatory inscription, which the Chronicle of Guglielmo Ongarello, written around 1441, records was placed over the tomb of *Opilio*, supported by two columns above the entrance door of the oratory [13]. The text of the inscription («Opilio [vir] c[larissimus]/et in[lustris] p[raefectus] p[raetorio] adq[ue]/patricius, hanc/basilicam, vel ora/torium, in honore/s[an]c[t]ae Iustinae mar/tyris a fundamentis/coeptam Deo iu/vante perfe/cit»: Opilio, highly regarded man and illustrious prefect of praetorium and patrician, made from the foundations this basilica and oratory in honour of Saint Justina Martyr with the help of God) does not mention the office of consul, held by *Opilio* in AD 524. For this reason, both the inscription and the construction of the basilica would be earlier than that date.

SG\_25. Fragment of chancel screen panel, which features a lamb and, in the background, a highly stylized fruiting palm tree. A grooved border is preserved along the bottom and right side of this panel. The images can be traced back to the iconographic theme of lambs (or deer) flanking a cross, a clipeus with a chrismon, or a cantharus, which were widespread in liturgical furnishings (especially in the decoration of chancel screen panels and sarcophagi) in the Upper Adriatic area during the 6th century [14,15].

SG\_27. Fragment of slab, cut along the short sides, with a portrait bust of a beardless youth, of uncertain date and significance. An inscription, dated to a period of later re-use of



the object in a new context, identifies the portrait as that of Saint Prosdocimo («S[an]c[tu]s Prosdocimus/ep[iscopu]s et confess[or]»: Saint Prosdocimo, bishop and confessor). On either side of the portrait are two fruiting palm trees, similar to those on the chancel panel SG\_25. The marble surface shows wear from continuous rubbing, probably by worshippers for devotional purposes.

SG\_28. Chancel screen panel, divided into two squares decorated with vines sprouting grapes and leaves, birds, and fruit, placed on either side of a central cross. The low relief and the lack of definition of some of the decorative details, which were simply shaped with a flat chisel, suggest an advanced but not finished stage of carving. It is possible to attribute the finishing of some details to the quarry-based workshops, especially in the left square; these details were intended as models to be used by local marble carvers. This practice was well attested in late antiquity and can be seen, for example, in a group of plinths in the church of Sant'Apollinare in Classe in Ravenna [16].

SG\_30. Pier decorated with a series of concentric profiled grooves which form double, elongated rectangles with concave short ends. It belongs to a group of three piers, homogeneous in type and size, carved to a high level on all sides.

SG\_35. Pier colonnette, lacking the original capital, carved from a single block of marble measuring approximately 2 m in length and 17.5 cm to the side. In the 1960s, it was reassembled with three similar pier colonnettes and one architrave in the chancel screen closing the apse of the oratory. It belongs, like SG\_30, to a class of standardized artefacts widely exported from Constantinopolitan workshops to various locations around the Mediterranean basin between the 5th and 6th centuries AD [17].

SG\_39. Fragment of pier colonnette, decorated on two adjacent sides with concentric grooves which form double, elongated rectangles with concave short ends. Unlike the other finely dressed pier colonnettes, much of its surface remained roughly dressed and flattened with a flat chisel.

SG\_53. Triangular slab with an arched side, carved to a very high level on the front and rear sides. An identical slab, but in a reversed position, is preserved in the monastery collection. The function of these objects is uncertain.

## 2.2. Sampling and Analytical Techniques

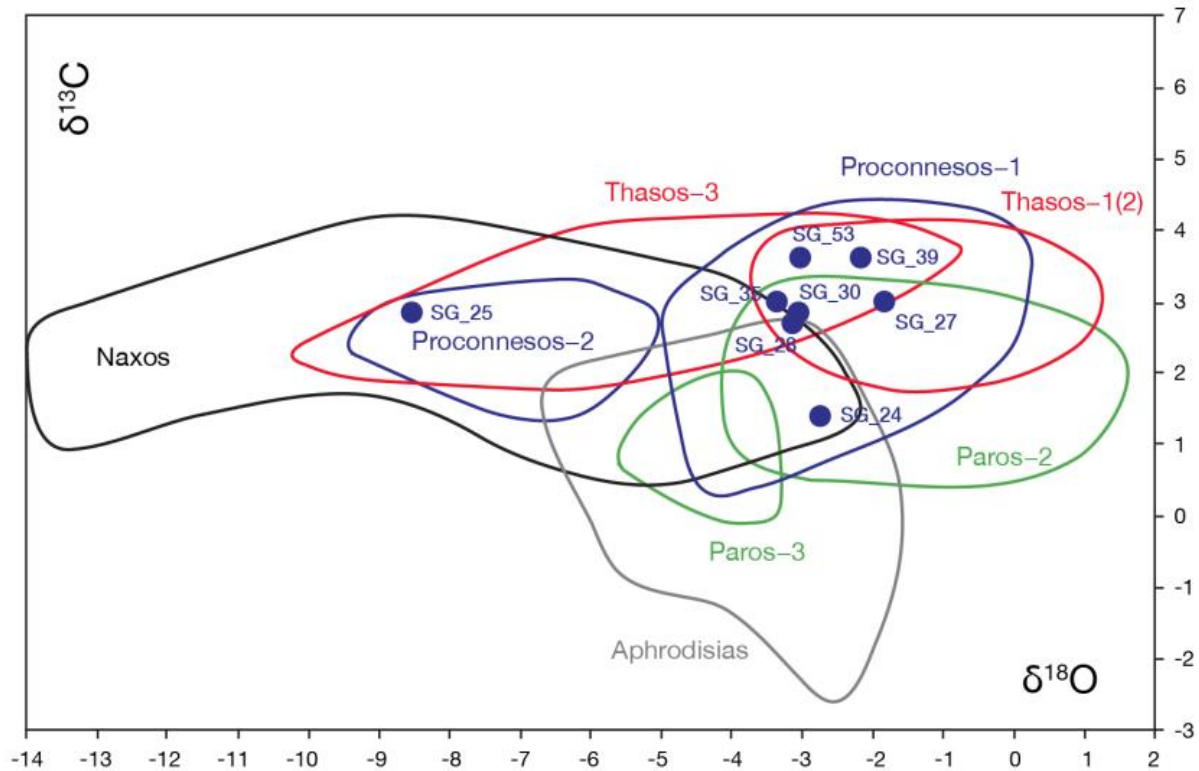
The marble samples were taken in the form of small chips (<1 cm<sup>3</sup> each), by means of a small chisel and a light hammer, from hidden or already damaged parts of the objects, focusing on undecorated areas in order not to compromise the integrity of the find. A representative portion of each sample was used for the preparation of a thin section and then petrographically studied by transmitted light polarizing optical microscopy (OM) under a Leitz LABORLUX 12 POL S polarized-light optical microscope equipped with a Leica MC170 HD digital single-lens camera. OM was useful in determining the minero-petrographic characteristics of the marbles: fabric/microstructure; maximum grain size (MGS) of the largest carbonate crystals expressed in mm; grain boundary shape (GBS); and the presence and relative abundance of accessory minerals. The possible presence of dolomite was evaluated through X-ray powder diffraction using the Panalytical Empyrean diffractometer of LAMA—Laboratory for Analysis of the Ancient Materials (Iuav University of Venice)—operating in Bragg–Brentano reflection geometry equipped with CuK $\alpha$  radiation (operating at 40 kV and 40 mA) and an X'Celerator detector.

An aliquot of a few tens of milligrams of each of the samples was prepared as a fine-grained powder in an agate hand mortar and then subjected to the analysis of stable carbon and oxygen isotopes [18], performed with the Thermo Scientific Delta V Advantage Isotopic Ratio Mass Spectrometer of the Department of Geosciences of the University of Padova. The results of the isotopic analyses were expressed as ‰ delta notations ( $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$ ) relative to V-PDB (Vienna-Pee Dee Belemnite) [19]. The reproducibility of the isotopic measures was verified by means of replicated analyses of laboratory standards calibrated to NBS19 [20] and LSVEC [21]. The petrographic and  $\delta^{18}\text{O}$  vs.  $\delta^{13}\text{C}$  records were compared with the latest databanks compiled for the main types of Mediterranean white marble used

in antiquity, as proposed by Antonelli and Lazzarini (2015), with supplementary data from Attanasio et al. [22], Wielgosz-Rondolino et al. [23], and Antonelli, Nestola [24].

### 3. Results

The mineralogical and petrographic features, as well as the isotopic signatures of all the samples, are shown in Table 1 and Figures 5 and 6.



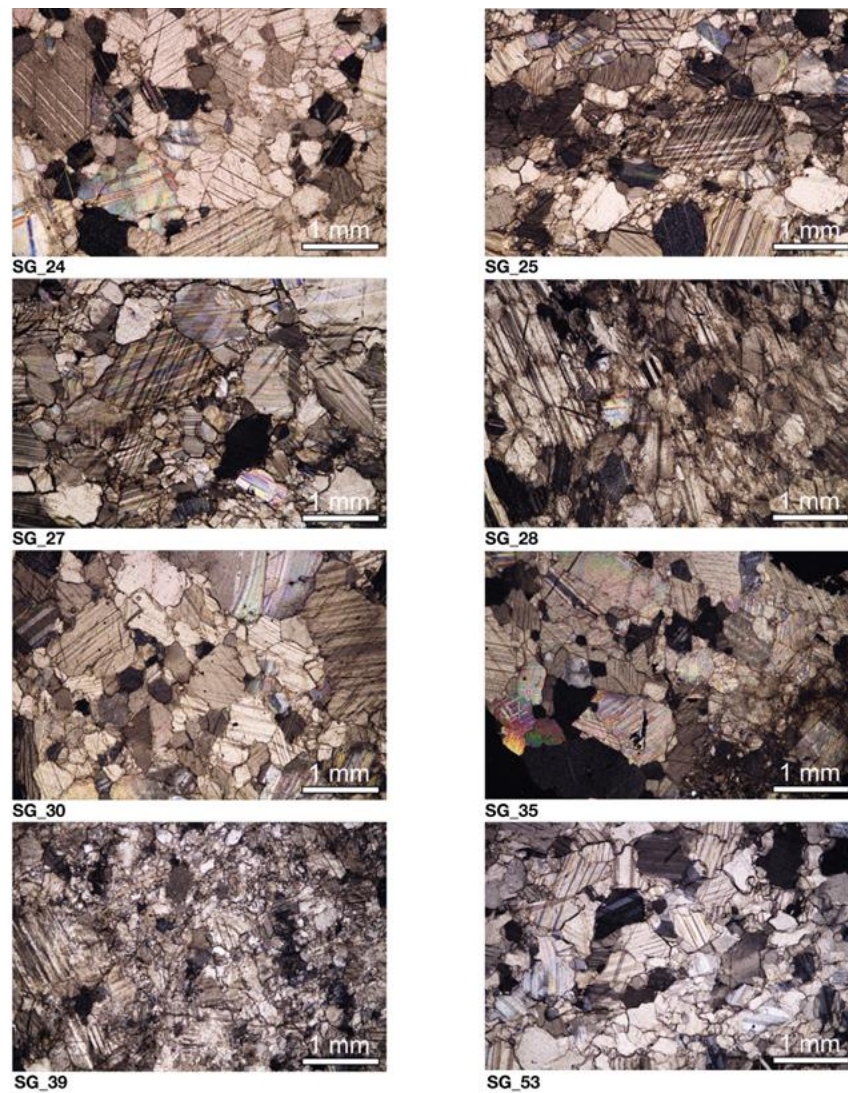
**Figure 5.** The isotopic signatures of the white marble artefacts of Santa Giustina. Isotopic fields for white medium-to-coarse-grained marbles (MGS > 2 mm) are from Antonelli and Lazzarini (2015).

Samples SG\_24, SG\_27, SG\_28, SG\_30, SG\_35, SG\_39, and SG\_53 share common characteristics: a heteroblastic fabric and a mortar microstructure made of calcite crystals with predominantly sutured and embayed boundaries (Figure 6a,c–h). The MGS values are over 2 mm in six cases out of seven; they vary from 3.44 mm (SG\_53) to 1.77 mm (SG\_35; the thin sectioned surface of this sample was the smaller one). Graphite and, often, opaque minerals (hematite, pyrite), such as apatite, potassic mica/phlogopite ± epidote, and quartz, are present as accessory minerals. All these features fit well with those of Proconnesian marble, also known as Marmara Marble, exploited in the Salayar district of Marmara Island (Turkey). The isotopic values (Table 1, Figure 5) support this provenance (Proconnesos-1).

Finally, sample SG\_25 also exhibits a heteroblastic fabric and a mortar microstructure, made of slightly deformed calcite crystals with predominantly sutured boundaries (Figure 6b). The MGS is 2.02 mm. Graphite, opaque minerals (pyrite and hematite), and apatite are present as accessory minerals. These mineralogical and petrographic features are again commonly found in classical Proconnesian marble; however, the isotopic values (Table 1, Figure 5) suggest a supply from the Camlik quarry district (Proconnesos-2) of Marmara Island (Turkey) [25].

**Table 1.** Minero-petrographic features of the marble samples, together with the isotopic signatures of the marble artefacts and their probable quarry sources. Legend of symbols: MGS: maximum grain size; GBS: shape of the carbonate grain boundaries; HE: heteroblastic; HO: homeoblastic; +++: very abundant; ++: abundant; +: present; ±: traces.

Object	Sample	Fabric/Microstructure	Calcite Crystal Boundaries	M.G.S. (mm)	Accessory Minerals							$\delta^{18}\text{O}$	$\delta^{13}\text{C}$	Most Probable Origin	
					Auatz	K-mica	Graphite	Apatite	Opaque Minerals	Epidote	Plagioclase				
Triangular lintel with dedicatory inscription	SG_24	HE	Mortar-like	Sutured/Embayed	3.27		=+Phl?	++	±	+ / ±	±		−2.89	1.40	Marmara Isl Saraylar (Turkey)
Fragment of chancel screen panel	SG_25	HE	Mortar-like with slightly deformed crystals	Sutured	2.02			+++	+	++(Py,Hem)			−8.74	2.71	Marmara Isl Saraylar (Turkey)
Fragment of slab with portrait	SG_27	HE	Mortar-like/Mosaic	Sutured± Embayed	3.25			+		±			−1.91	2.93	Marmara Isl Saraylar (Turkey)
Chancel screen panel	SG_28	HE	Mortar-like	Sutured	2.06			++		±			−3.15	2.64	Marmara Isl Saraylar (Turkey)
Pier	SG_30	HE	Mortar-like with slightly deformed crystals deformed crystals	Sutured/ Embayed	2.10			++	±	±(Hem)			−3.09	2.81	Marmara Isl Saraylar (Turkey)
Pier-colonnette	SG_35	HE	Mortar-like	Sutured/ Embayed	1.77	±	±	++					−3.66	2.77	Marmara Isl Saraylar (Turkey)
Fragment of pier-colonnette	SG_39	HE	Mortar-like with slightly deformed crystals	Sutured	2.05			+++	+	++(Py,Hem)			−2.84	3.10	Marmara Isl Saraylar (Turkey)
Triangular slab	SG_53	HE	Mortar-like	Sutured/ Embayed	3.44			++	±	+ / ±	±		−0.52	2.64	Marmara Isl Saraylar (Turkey)



**Figure 6.** Photomicrographs representative of the heteroblastic fabrics and prevailing mortar microstructures of the studied marble artefacts (crossed polars). All of the samples are characterized by mortar microstructures made of calcite crystals with prevailing, embayed, locally sutured, boundaries. Quantities of variable amounts of fine graphite are often distributed into the carbonate mass.

#### 4. Discussion

The mineralogical–petrographic and isotopic analyses confirm that all the sculptures from Santa Giustina are made of the distinctive grey-streaked white marble from the quarries of Marmara Island (ancient Proconnesos), in the western region of the Sea of Marmara, around 100 km from Constantinople (modern Istanbul, Turkey). This was the most widely used marble for the architectural elements and liturgical furnishings of high-status buildings between the 5th and 6th centuries AD, especially by the imperial authority and the aristocratic and ecclesiastical elites linked to the Eastern Roman Empire [16,26,27].

The sculptures probably belonged to a complete set of furnishings, newly carved as a specific commission by workshops operating in Constantinople, as evidenced by their stylistic homogeneity and advanced level of carving, the exclusive use of Proconnesian marble, and the presence of mass-produced artefacts, which were widely exported from the imperial capital throughout the Mediterranean. An important clue supporting a single workshop producing a single commission is given by the similar isotopic signature of samples SG\_28 and SG\_30 (taken from a chancel screen and a pier, respectively), suggesting their provenance from the same quarry *locus* or even from the same marble block.



These various marble elements of the liturgical furnishings were not shipped at the same working stage. Pier colonettes, carved from a unique block of marble, were worked to the most advanced stage of carving and were ready to be used with only minor modifications to ensure they could fit against the sides of their associated chancel screens. Other pieces, such as the chancel panel SG\_28 and the pier SG\_39, were shipped at a relatively advanced stage but not fully finished. This prompts a hypothesis that local marble workshops were involved directly in the building construction, hired by the commissioner to assemble the objects and finish some of the elements. On the other hand, the existence in Ostrogothic Italy of marble-working craftsmen (*marmorarii*), who travelled to complete specific commissions and were recruited by public authorities, is attested by a letter from king Theodoric to *Agapitus*, urban Prefect of Rome (Cassiodorus, *Variae* I, 6) [28]. The presence on site of local workshops is also demonstrated by a fragment chancel panel, which is stylistically very similar to SG\_25 but was shown by petrographic analysis to have been carved from Aurisina limestone (Figure 7) [29]. The use of Aurisina limestone could be connected with the commercial traffic of the Gothic kingdom, which involved extensive importation of goods from the Istrian province, defined by Cassiodorus as «the Imperial city's pantry» (*Variae* XII, 22). The use of freshly quarried Istrian limestone for public buildings, architectonic elements, and sarcophagi is widely attested in Ravenna during the 6th century AD, as evidenced for example by the mausoleum of Theodoric and the ambo of the Arian cathedral [30]. In our case, however, one should not exclude a short-range supply of the raw material, taken from an ancient monument in the surrounding area and reused for a new function.



**Figure 7.** Chancel panel carved in Aurisina limestone (on the left) and chancel panel SG\_25 (on the right).

The simultaneous importation of half-finished and finished carved objects from the workshops of Constantinople was not uncommon during the 6th century AD, as attested by the wrecks of Amrit, in Syria [31], and Marzamemi 2, sunk off the eastern coast of Sicily [32]. Marble artefacts at different stages of working were also imported for the architectural furnishings of the church of Sant'Apollinare in Classe in Ravenna, built by the bishop Ursicino between AD 533 and 536, as recently demonstrated by G. Marsili [16].

## 5. Conclusions

The results of the archaeometric and stylistic analyses conducted on the eight marble pieces investigated here and preserved in the suburban basilica of Santa Giustina in Padova represent a major contribution to the history of this monument and solve some of the previously unresolved questions noted at the start of this paper.

The study not only establishes that all the fragments are carved in Proconnesian marble, but also demonstrates their belonging to the same set of liturgical and architectural furnishings, newly produced in a geographical and cultural *milieu* close to the imperial authority. These data confirm the high-status patron who commissioned the construction of the basilica in the early 6th century, probably operating in the name of the Ostrogothic king Theodoric (AD 454–526), who had spent his formative years at the imperial court in Constantinople. *Opilio's* role can easily be explained by considering the functions and prerogatives of the praetorian prefect in the Ostrogothic kingdom: the coordination of the maintenance of public buildings and, in particular, the supervision of public transportation and foreign trade [33]. The strategic interest of Theodoric in this region can be seen in other nearby civil and religious monuments (in Montegrotto, Monselice, Este and Vicenza) and in the city of Padova itself, where, according to G.P. Brogiolo, he perhaps reorganised the southern defensive structures during the conflict against the imperial *milites* [1].

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/heritage6030163/s1>.

**Author Contributions:** Conceptualization, P.V.; methodology, F.A., M.S. and G.A.; validation, F.A. and G.A.; investigation, F.A. and P.V.; writing—original draft preparation, P.V., F.A. and M.S.; writing—review and editing, P.V., F.A., M.S. and G.A. All authors have read and agreed to the published version of the manuscript.

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**Conflicts of Interest:** The authors declare no conflict of interest.

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