

# Marble Slabs Used at the Archaeological Site of Sorna near Poreč Istria - Croatia

---

Gobić-Bravar, Đeni

*Source / Izvornik:* **ASMOSIA XI, Interdisciplinary Studies on Ancient Stone, Proceedings of the XI International Conference of ASMOSIA, 2018, 871 - 877**

**Conference paper / Rad u zborniku**

*Publication status / Verzija rada:* **Published version / Objavljena verzija rada (izdavačev PDF)**

<https://doi.org/10.31534/XI.asmosia.2015/08.06>

*Permanent link / Trajna poveznica:* <https://um.nsk.hr/um:nbn:hr:123:746178>

*Rights / Prava:* [In copyright](#)/[Zaštićeno autorskim pravom.](#)

*Download date / Datum preuzimanja:* **2025-01-24**



*Repository / Repozitorij:*

[FCEAG Repository - Repository of the Faculty of Civil Engineering, Architecture and Geodesy, University of Split](#)





# ASMOSIA XI

Interdisciplinary Studies on Ancient Stone

## PROCEEDINGS

of the XI ASMOSIA Conference, Split 2015

Edited by Daniela Matetić Poljak and Katja Marasović



Interdisciplinary Studies on Ancient Stone  
Proceedings of the XI ASMOSIA Conference (Split 2015)

Publishers:

ARTS ACADEMY IN SPLIT  
UNIVERSITY OF SPLIT

and

UNIVERSITY OF SPLIT  
FACULTY OF CIVIL ENGINEERING,  
ARCHITECTURE AND GEODESY

Technical editor:  
Kate Bošković

English language editor:  
Graham McMaster

Computer pre-press:  
Nikola Križanac

Cover design:  
Mladen Čulić

Cover page:

*Sigma shaped mensa of pavonazzetto marble from Diocletian's palace in Split*

ISBN 978-953-6617-49-4 (Arts Academy in Split)

ISBN 978-953-6116-75-1 (Faculty of Civil Engineering, Architecture and Geodesy)

e-ISBN 978-953-6617-51-7 (Arts Academy in Split)

e-ISBN 978-953-6116-79-9 (Faculty of Civil Engineering, Architecture and Geodesy)

CIP available at the digital catalogue of the University Library in Split, no 170529005

Association for the Study of Marble & Other Stones in Antiquity

# ASMOSIA XI

## Interdisciplinary Studies of Ancient Stone

Proceedings of the Eleventh International Conference of ASMOSIA,  
Split, 18–22 May 2015

Edited by  
Daniela Matetić Poljak  
Katja Marasović



Split, 2018

**Nota bene**

All papers are subjected to an international review.

The quality of the images relies on the quality of the originals provided by the authors.

# CONTENT

<b>PRESENTATION</b> .....	15
<b>NECROLOGY: NORMAN HERZ (1923-2013) by Susan Kane</b> .....	17
<b>1. APPLICATIONS TO SPECIFIC ARCHEOLOGICAL QUESTIONS – USE OF MARBLE</b>	
Hermaphrodites and Sleeping or Reclining Maenads: Production Centres and Quarry Marks <i>Patrizio Pensabene</i> .....	25
First Remarks about the Pavement of the Newly Discovered Mithraeum of the Colored Marbles at Ostia and New Investigations on Roman and Late Roman White and Colored Marbles from Insula IV, IX <i>Massimiliano David, Stefano Succi and Marcello Turci</i> .....	33
Alabaster. Quarrying and Trade in the Roman World: Evidence from Pompeii and Herculaneum <i>Simon J. Barker and Simona Perna</i> .....	45
Recent Work on the Stone at the Villa Arianna and the Villa San Marco (Castellammare di Stabia) and Their Context within the Vesuvian Area <i>Simon J. Barker and J. Clayton Fant</i> .....	65
Marble Wall Decorations from the Imperial Mausoleum (4 <sup>th</sup> C.) and the Basilica of San Lorenzo (5 <sup>th</sup> C.) in Milan: an Update on Colored Marbles in Late Antique Milan <i>Elisabetta Neri, Roberto Bugini and Silvia Gazzoli</i> .....	79
Sarcophagus Lids Sawn from their Chests <i>Dorothy H. Abramitis and John J. Herrmann</i> .....	89
The Re-Use of Monolithic Columns in the Invention and Persistence of Roman Architecture <i>Peter D. De Staebler</i> .....	95
The Trade in Small-Size Statues in the Roman Mediterranean: a Case Study from Alexandria <i>Patrizio Pensabene and Eleonora Gasparini</i> .....	101
The Marble Dedication of Komon, Son of Asklepiades, from Egypt: Material, Provenance, and Reinforcement of Meaning <i>Patricia A. Butz</i> .....	109
Multiple Reuse of Imported Marble Pedestals at Caesarea Maritima in Israel <i>Barbara Burrell</i> .....	117
Iasos and Iasian Marble between the Late Antique and Early Byzantine Eras <i>Diego Peirano</i> .....	123

Thassos, Known Inscriptions with New Data <i>Tony Kozelj and Manuela Wurch-Kozelj</i> .....	131
The Value of Marble in Roman <i>Hispalis</i> : Contextual, Typological and Lithological Analysis of an Assemblage of Large Architectural Elements Recovered at N° 17 Goyeneta Street (Seville, Spain) <i>Ruth Taylor, Oliva Rodríguez, Esther Ontiveros, María Luisa Loza, José Beltrán and Araceli Rodríguez</i> .....	143
<i>Giallo Antico</i> in Context. Distribution, Use and Commercial Actors According to New Stratigraphic Data from the Western Mediterranean (2 <sup>nd</sup> C. Bc – Late 1 <sup>st</sup> C. Ad) <i>Stefan Ardeleanu</i> .....	155
<i>Amethystus</i> : Ancient Properties and Iconographic Selection <i>Luigi Pedroni</i> .....	167
<b>2. PROVENANCE IDENTIFICATION I: (MARBLE)</b>	
Unraveling the Carrara – Göktepe Entanglement <i>Walter Prochaska, Donato Attanasio and Matthias Bruno</i> .....	175
The Marble of Roman Imperial Portraits <i>Donato Attanasio, Matthias Bruno, Walter Prochaska and Ali Bahadır Yavuz</i> .....	185
Tracing Alabaster (Gypsum or Anhydrite) Artwork Using Trace Element Analysis and a Multi-Isotope Approach (Sr, S, O) <i>Lise Leroux, Wolfram Kloppmann, Philippe Bromblet, Catherine Guerrot, Anthony H. Cooper, Pierre-Yves Le Pogam, Dominique Vingtain and Noel Worley</i> .....	195
Roman Monolithic Fountains and Thasian Marble <i>Annewies van den Hoek, Donato Attanasio and John J. Herrmann</i> .....	207
Archaeometric Analysis of the Alabaster Thresholds of Villa A, Oplontis (Torre Annunziata, Italy) and New Sr and Pb Isotopic Data for <i>Alabastro Ghiaccione del Circeo</i> <i>Simon J. Barker, Simona Perna, J. Clayton Fant, Lorenzo Lazzarini and Igor M. Villa</i> .....	215
Roman Villas of Lake Garda and the Occurrence of Coloured Marbles in the Western Part of “Regio X Venetia et Histria” (Northern Italy) <i>Roberto Bugini, Luisa Folli and Elisabetta Roffia</i> .....	231
Calcitic Marble from Thasos in the North Adriatic Basin: Ravenna, Aquileia, and Milan <i>John J. Herrmann, Robert H. Tykot and Annewies van den Hoek</i> .....	239
Characterisation of White Marble Objects from the Temple of Apollo and the House of Augustus (Palatine Hill, Rome) <i>Francesca Giustini, Mauro Brilli, Enrico Gallochio and Patrizio Pensabene</i> .....	247
Study and Archeometric Analysis of the Marble Elements Found in the Roman Theater at Aeclanum (Mirabella Eclano, Avellino - Italy) <i>Antonio Mesisca, Lorenzo Lazzarini, Stefano Cancelliere and Monica Salvadori</i> .....	255



Two Imperial Monuments in Puteoli: Use of Proconnesian Marble in the Domitianic and Trajanic Periods in Campania <i>Irene Bald Romano, Hans Rupprecht Goette, Donato Attanasio and Walter Prochaska</i> .....	267
Coloured Marbles in the Neapolitan Pavements (16 <sup>th</sup> And 17 <sup>th</sup> Centuries): the Church of <i>Santi Severino e Sossio</i> <i>Roberto Bugini, Luisa Folli and Martino Solito</i> .....	275
Roman and Early Byzantine Sarcophagi of Calcitic Marble from Thasos in Italy: Ostia and Siracusa <i>Donato Attanasio, John J. Herrmann, Robert H. Tykot and Annewies van den Hoek</i> .....	281
Revisiting the Origin and Destination of the Late Antique Marzamemi 'Church Wreck' Cargo <i>Justin Leidwanger, Scott H. Pike and Andrew Donnelly</i> .....	291
The Marbles of the Sculptures of Felix Romuliana in Serbia <i>Walter Prochaska and Maja Živić</i> .....	301
Calcitic Marble from Thasos and Proconnesos in Nea Anchialos (Thessaly) and Thessaloniki (Macedonia) <i>Vincent Barbin, John J. Herrmann, Aristotle Mentzos and Annewies van den Hoek</i> .....	311
Architectural Decoration of the Imperial Agora's Porticoes at Iasos <i>Fulvia Bianchi, Donato Attanasio and Walter Prochaska</i> .....	321
The Winged Victory of Samothrace - New Data on the Different Marbles Used for the Monument from the Sanctuary of the Great Gods <i>Annie Blanc, Philippe Blanc and Ludovic Laugier</i> .....	331
Polychrome Marbles from the Theatre of the Sanctuary of Apollo Pythios in Gortyna (Crete) <i>Jacopo Bonetto, Nicolò Mareso and Michele Bueno</i> .....	337
Paul the Silentiary, Hagia Sophia, Onyx, Lydia, and Breccia Corallina <i>John J. Herrmann and Annewies van den Hoek</i> .....	345
Incrustations from Colonia Ulpia Traiana (Near Modern Xanten, Germany) <i>Vilma Ruppiniè and Ulrich Schüssler</i> .....	351
Stone Objects from Vindobona (Austria) – Petrological Characterization and Provenance of Local Stone in a Historico-Economical Setting <i>Andreas Rohatsch, Michaela Kronberger, Sophie Insulander, Martin Mosser and Barbara Hodits</i> .....	363
Marbles Discovered on the Site of the Forum of Vaison-la-Romaine (Vaucluse, France): Preliminary Results <i>Elsa Roux, Jean-Marc Mignon, Philippe Blanc and Annie Blanc</i> .....	373
Updated Characterisation of White Saint-Béat Marble. Discrimination Parameters from Classical Marbles <i>Hernando Royo Plumed, Pilar Lapeunte, José Antonio Cuchí, Mauro Brillì and Marie-Claire Savin</i> .....	379

Grey and Greyish Banded Marbles from the Estremoz Anticline in Lusitania <i>Pilar Lapuente, Trinidad Nogales-Basarrate, Hernando Royo Plumed, Mauro Brilli and Marie-Claire Savin</i> .....	391
New Data on Spanish Marbles: the Case of <i>Gallaecia</i> (NW Spain) <i>Anna Gutiérrez García-M., Hernando Royo Plumed and Silvia González Soutelo</i> .....	401
A New Roman Imperial Relief Said to Be from Southern Spain: Problems of Style, Iconography, and Marble Type in Determining Provenance <i>John Pollini, Pilar Lapuente, Trinidad Nogales-Basarrate and Jerry Podany</i> .....	413
Reuse of the <i>Marmorata</i> from the Late Roman Palatial Building at Carranque (Toledo, Spain) in the Visigothic Necropolis <i>Virginia García-Entero, Anna Gutiérrez García-M. and Sergio Vidal Álvarez</i> .....	427
Imperial Porphyry in Roman Britain <i>David F. Williams</i> .....	435
Recycling of Marble: Apollonia/Sozousa/Arsuf (Israel) as a Case Study <i>Moshe Fischer, Dimitris Tambakopoulos and Yannis Maniatis</i> .....	443
Thasian Connections Overseas: Sculpture in the Cyrene Museum (Libya) Made of Dolomitic Marble from Thasos <i>John J. Herrmann and Donato Attanasio</i> .....	457
Marble on Rome's Southwestern Frontier: Thamugadi and Lambaesis <i>Robert H. Tykot, Ouahiba Bouzidi, John J. Herrmann and Annewies van den Hoek</i> .....	467
Marble and Sculpture at Lepcis Magna (Tripolitania, Libya): a Preliminary Study Concerning Origin and Workshops <i>Luisa Musso, Laura Buccino, Matthias Bruno, Donato Attanasio and Walter Prochaska</i> .....	481
The Pentelic Marble in the Carnegie Museum of Art Hall of Sculpture, Pittsburgh, Pennsylvania <i>Albert D. Kollar</i> .....	491
Analysis of Classical Marble Sculptures in the Michael C. Carlos Museum, Emory University, Atlanta <i>Robert H. Tykot, John J. Herrmann, Renée Stein, Jasper Gaunt, Susan Blevins and Anne R. Skinner</i> .....	501
<b>3. PROVENANCE IDENTIFICATION II: (OTHER STONES)</b>	
Aphrodisias and the Regional Marble Trade. The <i>Scaenae Frons</i> of the Theatre at Nysa <i>Natalia Toma</i> .....	513
The Stones of Felix Romuliana (Gamzigrad, Serbia) <i>Bojan Djurić, Divna Jovanović, Stefan Pop Lazić and Walter Prochaska</i> .....	523
Aspects of Characterisation of Stone Monuments from Southern Pannonia <i>Branka Migotti</i> .....	537

The Budakalász Travertine Production <i>Bojan Djurić, Sándor Kele and Igor Rižnar</i> .....	545
Stone Monuments from Carnuntum and Surrounding Areas (Austria) – Petrological Characterization and Quarry Location in a Historical Context <i>Gabrielle Kremer, Isabella Kitz, Beatrix Moshhammer, Maria Heinrich and Erich Draganits</i> .....	557
Espejón Limestone and Conglomerate (Soria, Spain): Archaeometric Characterization, Quarrying and Use in Roman Times <i>Virginia García-Entero, Anna Gutiérrez García-M, Sergio Vidal Álvarez, María J. Peréx Agorreta and Eva Zarco Martínez</i> .....	567
The Use of Alcover Stone in Roman Times ( <i>Tarraco, Hispania Citerior</i> ). Contributions to the <i>Officina Lapidaria Tarraconensis</i> <i>Diana Gorostidi Pi, Jordi López Vilar and Anna Gutiérrez García-M.</i> .....	577
<b>4. ADVANCES IN PROVENANCE TECHNIQUES, METHODOLOGIES AND DATABASES</b>	
Grainautline – a Supervised Grain Boundary Extraction Tool Supported by Image Processing and Pattern Recognition <i>Kristóf Csorba, Lilla Barancsuk, Balázs Székely and Judit Zöldföldi</i> .....	587
A Database and GIS Project about Quarrying, Circulation and Use of Stone During the Roman Age in <i>Regio X - Venetia et Histria</i> . The Case Study of the Euganean Trachyte <i>Caterine Previato and Arturo Zara</i> .....	597
<b>5. QUARRIES AND GEOLOGY</b>	
The Distribution of Troad Granite Columns as Evidence for Reconstructing the Management of Their Production <i>Patrizio Pensabene, Javier Á. Domingo and Isabel Rodà</i> .....	613
Ancient Quarries and Stonemasonry in Northern Choria Considiana <i>Hale Güney</i> .....	621
Polychromy in Larisaeon Quarries and its Relation to Architectural Conception <i>Gizem Mater and Ertunç Denктаş</i> .....	633
Euromos of Caria: the Origin of an Hitherto Unknown Grey Veined Stepped Marble of Roman Antiquity <i>Matthias Bruno, Donato Attanasio, Walter Prochaska and Ali Bahadır Yavuz</i> .....	639
Unknown Painted Quarry Inscriptions from Bacakale at <i>Docimium</i> (Turkey) <i>Matthias Bruno</i> .....	651
The Green Schist Marble Stone of Jebel El Hairech (North West of Tunisia): a Multi-Analytical Approach and its Uses in Antiquity <i>Ameur Younès, Mohamed Gaied and Wissem Gallala</i> .....	659
Building Materials and the Ancient Quarries at <i>Thamugadi</i> (East of Algeria), Case Study: Sandstone and Limestone <i>Younès Rezkallah and Ramdane Marmi</i> .....	673

The Local Quarries of the Ancient Roman City of <i>Valeria</i> (Cuenca, Spain) <i>Javier Atienza Fuente</i> .....	683
The Stone and Ancient Quarries of Montjuïc Mountain (Barcelona, Spain) <i>Aureli Álvarez</i> .....	693
<i>Notae Lapidinarum</i> : Preliminary Considerations about the Quarry Marks from the Provincial Forum of <i>Tarraco</i> <i>Maria Serena Vinci</i> .....	699
The Different Steps of the Rough-Hewing on a Monumental Sculpture at the Greek Archaic Period: the Unfinished Kouros of Thasos <i>Danièle Braunstein</i> .....	711
A Review of Copying Techniques in Greco-Roman Sculpture <i>Séverine Moureaud</i> .....	717
Labour Forces at Imperial Quarries <i>Ben Russell</i> .....	733
Social Position of Craftsmen inside the Stone and Marble Processing Trades in the Light of Diocletian's Edict on Prices <i>Krešimir Bosnić and Branko Matulić</i> .....	741
<b>6. STONE PROPERTIES, WEATHERING EFFECTS AND RESTORATION, AS RELATED TO DIAGNOSIS PROBLEMS, MATCHING OF STONE FRAGMENTS AND AUTHENTICITY</b>	
Methods of Consolidation and Protection of Pentelic Marble <i>Maria Apostolopoulou, Elissavet Drakopoulou, Maria Karoglou and Asterios Bakolas</i> .....	749
<b>7. PIGMENTS AND PAINTINGS ON MARBLE</b>	
Painting and Sculpture Conservation in Two Gallo-Roman Temples in Picardy (France): Champlieu and Pont-Sainte-Maxence <i>Véronique Brunet-Gaston and Christophe Gaston</i> .....	763
The Use of Colour on Roman Marble Sarcophagi <i>Eliana Siotto</i> .....	773
New Evidence for Ancient Gilding and Historic Restorations on a Portrait of Antinous in the San Antonio Museum of Art <i>Jessica Powers, Mark Abbe, Michelle Bushey and Scott H. Pike</i> .....	783
Schists and Pigments from Ancient Swat (Khyber Pukhtunkhwa, Pakistan) <i>Francesco Mariottini, Gianluca Vignaroli, Maurizio Mariottini and Mauro Roma</i> .....	793
<b>8. SPECIAL THEME SESSION: „THE USE OF MARBLE AND LIMESTONE IN THE ADRIATIC BASIN IN ANTIQUITY”</b>	
Marble Sarcophagi of Roman Dalmatia Material – Provenance – Workmanship <i>Guntram Koch</i> .....	809

Funerary Monuments and Quarry Management in Middle Dalmatia <i>Nenad Cambi</i> .....	827
Marble Revetments of Diocletian's Palace <i>Katja Marasović and Vinka Marinković</i> .....	839
The Use of Limestones as Construction Materials for the Mosaics of Diocletian's Palace <i>Branko Matulić, Domagoj Mudronja and Krešimir Bosnić</i> .....	855
Restoration of the Peristyle of Diocletian's Palace in Split <i>Goran Nikšić</i> .....	863
Marble Slabs Used at the Archaeological Site of Sorna near Poreč Istria – Croatia <i>Đeni Gobić-Bravar</i> .....	871
Ancient Marbles from the Villa in Verige Bay, Brijuni Island, Croatia <i>Mira Pavletić and Đeni Gobić-Bravar</i> .....	879
Notes on Early Christian Ambos and Altars in the Light of some Fragments from the Islands of Pag and Rab <i>Mirja Jarak</i> .....	887
The Marbles in the Chapel of the Blessed John of Trogir in the Cathedral of St. Lawrence at Trogir <i>Đeni Gobić-Bravar and Daniela Matetić Poljak</i> .....	899
The Use of Limestone in the Roman Province of Dalmatia <i>Edisa Lozić and Igor Rižnar</i> .....	915
The Extraction and Use of Limestone in Istria in Antiquity <i>Klara Buršić-Matijašić and Robert Matijašić</i> .....	925
Aurisina Limestone in the Roman Age: from Karst Quarries to the Cities of the Adriatic Basin <i>Caterina Previato</i> .....	933
The Remains of Infrastructural Facilities of the Ancient Quarries on Zadar Islands (Croatia) <i>Mate Parica</i> .....	941
The Impact of Local Geomorphological and Geological Features of the Area for the Construction of the Burnum Amphitheatre <i>Miroslav Glavičić and Uroš Stepišnik</i> .....	951
Roman Quarry Klis Kosa near Salona <i>Ivan Alduk</i> .....	957
Marmore Lavdata Brattia <i>Miona Miliša and Vinka Marinković</i> .....	963
Quarries of the Lumbarda Archipelago <i>Ivka Lipanović and Vinka Marinković</i> .....	979

Island of Korčula – Importer and Exporter of Stone in Antiquity <i>Mate Parica and Igor Borzić</i> .....	985
Faux Marbling Motifs in Early Christian Frescoes in Central and South Dalmatia: Preliminary Report <i>Tonči Borovac, Antonija Gluhan and Nikola Radošević</i> .....	995
<b>INDEX OF AUTHORS</b> .....	1009

## MARBLE SLABS USED AT THE ARCHAEOLOGICAL SITE OF SORNA NEAR POREČ ISTRIA – CROATIA

Đeni Gobić-Bravar

Archaeological museum of Istria, Pula, Croatia (gobic-bravar@ami-pula.hr; geni.gobic.bravar@gmail.com)

### Abstract

The Sorna peninsula near the town of Poreč was excavated in the years 1966 to 1968. Under the direction of the archaeologist Štefan Mlakar a Roman villa was found. Many archaeological objects were excavated together with parts of architecture, fresco fragments and marble slabs. Although the objects and the architecture parts were documented, the marble slabs did not have the same fate. After finding the marble slabs from Sorna in a wooden box, the author decided to restore and study them. The marble slabs were cleaned and treated with micro-crystalline wax to give a glimpse of the original shine. A few pieces could be glued together. The slabs were determined petrographically and then studied to define their possible use as wall or floor incrustations. Finally, a catalogue of slabs has been made.

### Keywords

use of marble, restoration, identification

### Introduction, the villa

In the second half of the 20<sup>th</sup> century the Istrian peninsula saw tourism as a source of revenue. (Fig. 1) At that time many tourist resorts like camps and hotels were built. As the places chosen for the resorts had to be beautiful they sometimes coincided with old Roman ruins. For this purpose the Sorna peninsula south of Poreč was excavated, under the direction of the archaeologist Štefan Mlakar, in the years 1966 to 1968 and a Roman villa was found (Fig. 2). The complex of the villa occupies the entire width of the peninsula, from the southern to the western coast. The main part of the villa comprises two square yards (atrium), the southern and the northern one. Around them the various rooms were arranged, as well as the functional parts of the building. On the south eastern part of the complex there was a centre for the water supply of the villa with basins that were filled from an aqueduct. Connected to the water supply system was a thermal complex with rooms for the heating of water and



Fig. 1. Location of the Sorna peninsula, south of Poreč (image: [www.arkod.hr](http://www.arkod.hr))



Fig. 2. Closer view of the location of the villa. The remains of the walls are barely visible (image: [www.arkod.hr](http://www.arkod.hr))

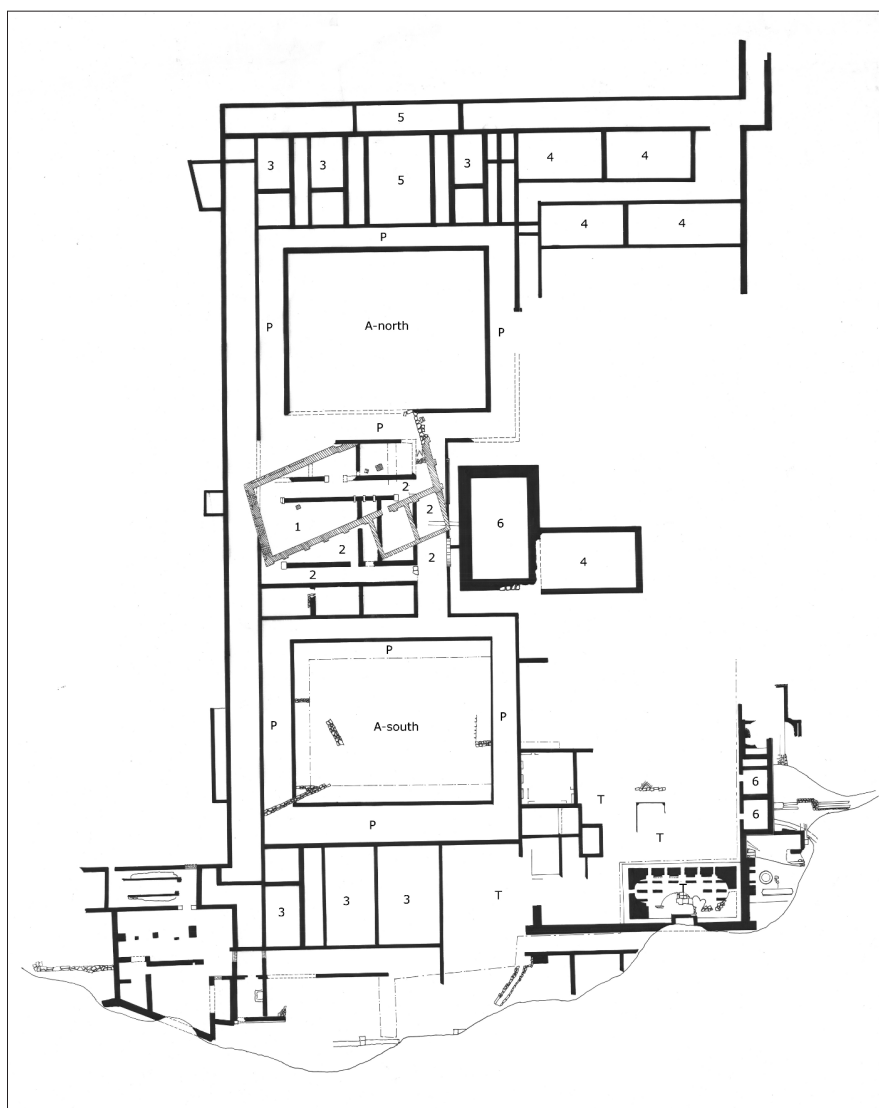


Fig. 3.  
Plan of the Roman villa at Sorna  
(from documentation archive of AMI).  
A – atrium,  
P – peristyle,  
T – thermal complex,  
1 – central complex of the villa,  
2 – rooms with mosaics,  
3 – residential spaces,  
4 – storage spaces,  
5 – main northern entrance,  
6 – water reservoirs

pools. The central part of the villa, a little bit elevated from the atrium, was the residential part with the most luxurious rooms. These rooms were richly decorated with fresco paintings and wall mosaics. The villa dates from the end of the 1<sup>st</sup> or beginning of the 2<sup>nd</sup> century and was occupied, with small interventions, until the 5<sup>th</sup> century (Fig. 3).<sup>1</sup>

Many archaeological objects were excavated, pottery, glass, metal objects and ancient coins, as well as parts of architecture, fresco fragments and marble slabs. However, the site was not excavated in a systematic way due to the lack of time as the works were connected to the building of the tourist complex.<sup>2</sup> The documentation of the excavation is very generic, and some objects like marbles and frescoes are only noted, not documented.

Although the ceramic objects, and few fresco fragments, architecture parts and marble slabs were studied

and recorded from the archaeological point of view the remaining fresco fragments and the marble slabs were not accorded the same treatment. Even the mosaic floors were not documented and only a few old photos of just parts of the floors can be seen today. It is a sad truth that little attention was given to these beautiful decorations, parts of the archaeological site, although they could add useful information to the understanding of the site and could be presented to the public to show the beauty of the ancient Roman decorative taste.

The few publications that speak about the villa mostly mention the findings of small objects<sup>3</sup>, the architectural elements, the mosaics and the rich fresco decoration. However there is no mention of marble findings at all.

1 MLAKAR 1986, 57-64.

2 MATIJAŠIĆ 1998, 124-127.

3 JURKIĆ 1981, 88-90.





Fig. 4. Marble slabs that were originally of rectangular shape (photo: Đ. Gobić-Bravar)

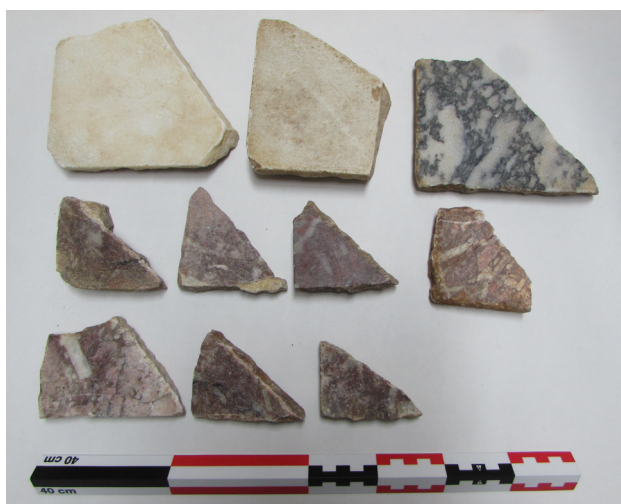


Fig. 5. Triangular marble slabs (photo: Đ. Gobić-Bravar)

### The marbles and their treatment

All the marble material (except for two marble slab fragments that have been recorded) was found in wooden boxes, scattered through the museum building, forgotten, first from the moment of the decadence of the villa, and then from the moment of their archaeological retrieval. It was decided, after 44 years, finally to study them and give them a possibility to be seen and admired again.

The marble slabs were only roughly washed so the first step was to clean them thoroughly and remove the incrustations, which were all of a carbonate nature. The incrustations were removed by applying pulps with ammonium bicarbonate and then mechanically with a scalpel. After drying, the surface of the slabs was treated with micro crystalline wax to provide a glimpse of the original shine, and a few pieces could be bonded together.



Fig. 6. Different slabs that could have been for partitions of panels or cornices (photo: Đ. Gobić-Bravar)

The recognition of the marbles was optical with the help of various publications<sup>4</sup> and catalogues<sup>5</sup>. The identified marbles and other stones present in the villa are: Greco scritto (54), *marmor chium* (35), *marmor carystium* (35), white marble (26), Proconnesian marble (26), black Ardesia stone (12 and lots of small fragments), bardiglio (9), *marmor thessalicum* (5), bigio antico (5), Breccia corallina (5), *marmor phrygium* (3). For the moment it was not possible to make an analysis of the white marbles so they are distinguished only according to their grain size. The white marbles are fine and medium grain marbles. There are also fragments of marbles that were not identified, and these are present in very small or even just one fragment.

The slabs can be distinguished into: slabs of rectangular (Fig. 4) and/or triangular shape (Fig. 5), slabs of elongated shape (Fig. 6), moulded slabs (Fig. 7), and slabs of different forms that could be part of a figural motif (Fig. 8). The thickness of the slabs varies from 4 cm to 0.8 cm. There is only one block of *marmor phrygium* with one polished side and a roughly worked back side 5.5 cm thick (Fig. 9). Many slabs show two straight edges being probably of rectangular or triangular shape. Slabs up to

4 LAZZARINI 2004, 74-100; PENSABENE 1998.

5 Corsi collection of decorative stone, [www.oum.ox.ac.uk/corsi/](http://www.oum.ox.ac.uk/corsi/); MUSNAF, [www.museofisiocritici.it](http://www.museofisiocritici.it).



Fig. 7. Moulded marble slabs (photo: Đ. Gobić-Bravar)



Fig. 9. The thick *marmor phrygium* block and the only two other examples of *marmor phrygium* slabs (photo: Đ. Gobić-Bravar)



Fig. 8. Slabs of particular shape with remains of mortar on all sides (photo: Đ. Gobić-Bravar)

1.5 cm thick have both sides polished (or one side shows saw cut traces), whilst the thicker ones have one polished side and a roughly worked back side and polished and slightly bevelled edges. It is also notable that on many polished sides it is still possible to notice the traces of sawing, which could point to local artisans working on the villa.

There are few types of mouldings (Table 1) that probably served to divide the wall decoration into horizontal panels. Mouldings with two bases smoothed and polished (so probable used as partitions for wall revetment) and with only one base smoothed and polished (probably used as socles). Three parting cornices were



Fig. 10. Three parting cornices (photo: Đ. Gobić-Bravar)

found (Fig. 10), all from different marble (*marmor carystium*, *marmor thessalicum* and Greco scritto marble). The parting cornice in Greco scritto marble has mortar remains on both sides, one remnant has a slightly curved section that could be the beginning of a fresco decoration. The rounded side of the slab was protruding from the wall for about 1 cm. The *marmor carystium* parting cornice has mortar remains only on one side, and the *marmor*

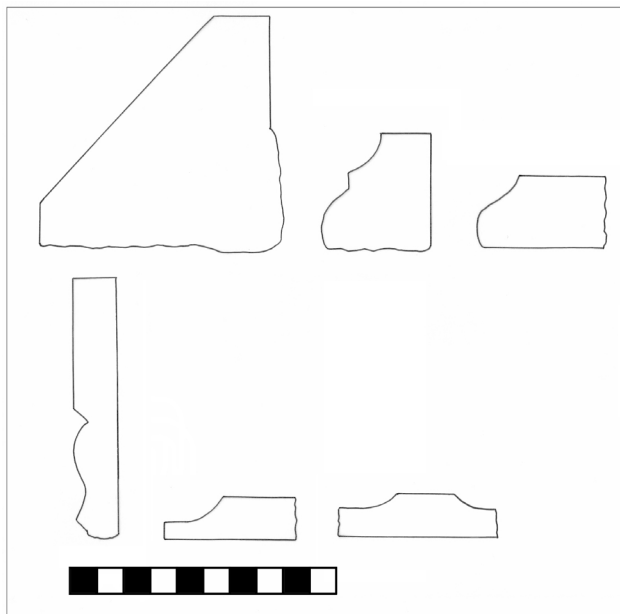


Table 1. Marble mouldings from the Roman villa in Sorna



Fig. 11. Part of a finely moulded slab, *marmor chium* (photo: Đ. Gobić-Bravar)

*thessalicum* cornice shows no mortar remains. The few fragments of *marmor chium* that could be reconstructed into part of a marble slab (Fig. 11) have a more elaborated moulding and were used as wall revetment<sup>6</sup>.

Many simple elongated slabs (Fig. 6) point to the presence of a design, whether in an *opus sectile* floor or for wall revetment. The height of these slabs varies from 4 cm to 10 cm.

There are some slabs of irregular shape (Fig. 8). As these slabs have traces of mortar on all their sides it is possible that they were part of a design. They could also have been part of a *scutulata* mosaic floor but there is no evidence of such a mosaic in the villa. Their thickness varies from 1 to 1.5 cm, so they were probably used in floor *opus sectile*.

6 Similar mouldings were found at the Horace villa, Lm-3 type, see: ANGELELI 2006, 813.



Fig. 12. Two marble blocks showing the cutting line for the production of slabs (photo: Đ. Gobić-Bravar)

### The technology

Although there are texts about the technology of producing *opus sectile* and wall revetment<sup>7</sup>, not many are related to the use of marble in the province. The territory of Croatia has not been thoroughly investigated with respect to this theme, and no publications have been produced. So it is important to note what could be learned from the marbles at the Sorna site.

Three marble blocks (Fig. 12), two of *marmor carystium* and one of white fine grained marble, are probably the remains of blocks from which the slabs were cut. All three blocks show a deep cutting line and a rough surface where the slab was detached. There are many slabs with a raised bit on the back side. The size of this bit varies from 0.5 cm to 4.5 cm. So the marble slabs were cut from the blocks on site.

7 See: ADAM 1988, 247-249; BRUTTO 1990, 325-376; GIULIANI CAIROLI 1990, 143-145; GIUDOBALDI 1993, 171-223; ANGELELLI 2007, 405-418.



Fig. 13. Slabs with holes for mounting on the wall (photo: Đ. Gobić-Bravar)

Many marble slabs show traces of sawing, more accentuated on what was probably the back side of the slab, but clearly visible, even after the polishing, on the front side of the slab. According to Pliny<sup>8</sup> this could be due to the type of sand used to cut and polish the slabs. Another reason could be that the local workers were not used to working with such types of stone.

Some information can be obtained also about the materials used to fix the slabs to the walls and/or to the floors<sup>9</sup>. The traces of mortar on the slabs are all of a finishing layer of mortar made of lime, fine sand and with traces of finely ground ceramic material. There are many traces, mostly on the back side of the slabs, of a brownish coating (mastic), possibly of an animal-based glue used to fix the small slabs or pieces of ceramic to the back of the slabs. Few marbles (Fig. 13) one white, medium grained, rectangular, marble slab and a bigio antico rectangular slab have a hole for a metal pin with green staining showing that the pin must have been of bronze. Another two white, medium grained, marble slabs have still inside an iron pin, which has developed a large rust stain on the surface of the slab.

Two other interesting pieces of marble were found. Two marble fragments (Fig. 14), one of *marmor chium* being originally of rectangular or triangular shape and one of white marble being originally of rhomboid shape, show original repairs. The *marmor chium* fragment was separated so it was possible to see the remains of the yellowish material used to bond the two pieces. The white marble fragment is still tightly bonded.



Fig. 14. Two marble slabs with original, ancient, repairs (photo: Đ. Gobić-Bravar)

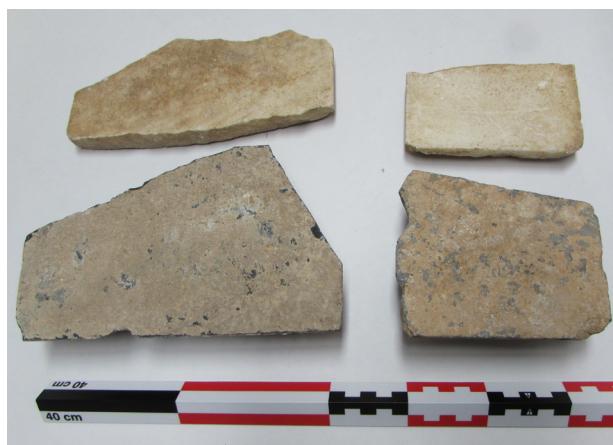


Fig. 15. Black limestone and white marble rectangle slabs (photo: Đ. Gobić-Bravar)

### Positioning the marbles inside the villa

It is very rare to find marble *in situ* in an archaeological excavation.<sup>10</sup> This is surely due to the re-utilisation of the precious stone in other buildings surrounding the site. Sorna is no exception. But in this case another problem for the right interpretation of the marble slabs is the lack of documentation. Also, there is no longer evidence of traces of marbles in mortars or visible holes in the walls that could mark the presence of revetment panels. So the reconstruction of the original use of the marbles is only based on clues, comparison with other sites and the use of logic.

The villa had a residential part and a thermal part, so the most probable place for the use of the precious marbles is in one of those two spaces. The moulded marble

8 PLINY, 1857, 325-326.

9 GIULIANI CAIROLI 1990, 143-145.

10 ANGELELLI 2006, 231-249.

elements could be connected with fresco decoration, so it is possible to place them in the central, residential part of the villa. The *thermae* spaces are in particular expected to have had marble surfaces. Since there is no mention of mosaics in the thermal part of the complex it is possible that the floors and walls of the baths were in marble. The thick slabs of white marble, Proconnesian marble and of black limestone were most probably floor tiles in auxiliary spaces. The black limestone and the white marble slabs (Fig. 15) are present as thick rectangular slabs. The slabs are 22 cm and 12.5 cm, but it is not possible to determine whether they were rectangles or squares.

### The villa today and conclusion

In the period from 1969 to 1971 the villa was conserved and covered so that only the upper part of the reconstructed walls, around 70 cm high, was visible. The archive photos show that the mosaic floors were conserved too. But those mosaics cannot be seen any more. Today the villa is part of the Zelena laguna tourist complex and there are no signs of a management and maintenance plan except that the grass is cut during the tourist season. It is very difficult to obtain from the site any data that could give clues as to in which of the villa spaces floor and/or wall marble revetment was used.

The marble material found at the Roman villa on the Sorna peninsula might be not enough to understand the decoration system of the villa. But it tells a lot of the importance of the site, of the route that has brought the marble blocks to the site (probably both by land and by sea) and about skill level of local craftsmanship.

### BIBLIOGRAPHY

- ADAM J. P. 1988: *L'arte di costruire presso i romani*, Milano, 247-249.
- ANGELELLI C. 2006: "Marbles", in B. FRISCHER, J. CRAWFORD, M. DE SIMONE (eds.): *The "Horace's villa" project 1997-2003*, Vol.1, Oxford, 231-249.
- ANGELELLI C. 2007: "I rivestimenti marmorei parietali del teatro romano di Brescia: nuovi dati da recenti ricerche archeologiche", *Atti AISCOM XII*, Tivoli, 405-418.
- BRUTTO M. L., VANNICOLA C. 1990: "Ricostruzione e tipologia delle crustae parietali in età imperiale", *Archeologia Classica XLII*, 325-376.
- GUIDOBALDI F. 1993: "Pavimenti in opus sectile di Roma e dell'area romana: proposte per una classificazione e criteri di datazione", in *Marmi antichi, problemi d'impiego, di restauro e d'identificazione*, Roma, 171-223.
- LAZZARINI L. 2004: *Pietre e marmi antichi*, Padova, 74-100.
- MATIJAŠIĆ R. 1998: *Gospodarstvo antičke Istre*, Pula, 124-127.
- MLAKAR Š. 1986: "Rimski građevinski kompleksi i interijeri rimskih vila na poreštini", in *Zbornik Poreštine*, vol. 2, Poreč, 57-64.
- JURKIĆ V. 1981: "Građevinski kontinuitet rimskih gospodarskih vila u zapadnoj Istri od antike do bizantskog doba", *Histria Historica*, vol. 2, 88-90.
- PENSABENE P. (ed.) 1998: *Marmi antichi II*, Roma.
- PENSABENE P., BRUNO M. 1998: *Il marmo e il colore*, Roma.
- PLINY S. 1857: *The natural history of Pliny*, vol. 6, book XXXVI, London, 325-326.