

Faux Marbling Motifs in Early Christian Frescoes in Central and South Dalmatia: Preliminary Report

Borovac, Tonči; Gluhan, Antonija; Radošević, Nikola

Source / Izvornik: **ASMOSIA XI, Interdisciplinary Studies on Ancient Stone, Proceedings of the XI International Conference of ASMOSIA, 2018, 995 - 1007**

Conference paper / Rad u zborniku

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

<https://doi.org/10.31534/XI.asmosia.2015/08.19>

Permanent link / Trajna poveznica: <https://um.nsk.hr/um:nbn:hr:123:119077>

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

Download date / Datum preuzimanja: **2024-11-21**



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

PRESENTATION	15
NECROLOGY: NORMAN HERZ (1923-2013) by Susan Kane	17
1. APPLICATIONS TO SPECIFIC ARCHEOLOGICAL QUESTIONS – USE OF MARBLE	
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 th C.) and the Basilica of San Lorenzo (5 th 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 nd C. Bc – Late 1 st C. Ad) <i>Stefan Ardeleanu</i>	155
<i>Amethystus</i> : Ancient Properties and Iconographic Selection <i>Luigi Pedroni</i>	167
2. PROVENANCE IDENTIFICATION I: (MARBLE)	
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 th And 17 th 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
3. PROVENANCE IDENTIFICATION II: (OTHER STONES)	
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
4. ADVANCES IN PROVENANCE TECHNIQUES, METHODOLOGIES AND DATABASES	
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
5. QUARRIES AND GEOLOGY	
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
6. STONE PROPERTIES, WEATHERING EFFECTS AND RESTORATION, AS RELATED TO DIAGNOSIS PROBLEMS, MATCHING OF STONE FRAGMENTS AND AUTHENTICITY	
Methods of Consolidation and Protection of Pentelic Marble <i>Maria Apostolopoulou, Elissavet Drakopoulou, Maria Karoglou and Asterios Bakolas</i>	749
7. PIGMENTS AND PAINTINGS ON MARBLE	
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
8. SPECIAL THEME SESSION: „THE USE OF MARBLE AND LIMESTONE IN THE ADRIATIC BASIN IN ANTIQUITY”	
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
INDEX OF AUTHORS	1009

FAUX MARBLING MOTIFS IN EARLY CHRISTIAN FRESCOES IN CENTRAL AND SOUTH DALMATIA: PRELIMINARY REPORT

Tonči Borovac¹, Antonija Gluhan¹ and Nikola Radošević²

¹ Croatian Conservation Institute Split, Split, Croatia (tborovac@h-r-z.hr; agluhan@gmail.com)

² Arts Academy in Split, University of Split, Split, Croatia (radniko@gmail.com)

Abstract

Throughout history, the faux marbling technique has been used as a more accessible substitute for natural marble and stone in decorating prestigious parts of structures of religious and secular use. The significance of this decorative technique in Dalmatia was expressed in the art of the Early Christian period, when reductions in the marble and stone market occurred due to the decay of the Roman Empire. The history and use of the faux marbling technique is under-researched and inadequately evaluated, especially along the eastern Adriatic coast. The aim of this study is to try to determine which types of natural marble or stone correspond to the examples of faux marbling found in archaeological sites presented. This comparison is expected to lay the foundation for a database for the classification of the types and origin of marble and stone used as templates in the implementation of imitations fabricated using the technique of faux marbling. The study used several representative examples of faux marbling on a number of sites in Central and Southern Dalmatia.

Keywords

faux marbling, Early Christianity, Dalmatia

Introduction

Marble is a material that throughout history, until recent times, has retained the title of luxurious and required merchandise, for a number of reasons, mainly because of the limitations and costs in the production, transportation and distribution. Therefore, it is not surprising that marble was a material mostly available only to the wealthiest institutions and members of society. During Antiquity the Mediterranean was known for widespread commercial activities, including a vigorous trade in marble products, numerous records of which exist in the remains of the quarries, archaeological sites, and written historical sources. The

marble trade usually started at the loading ports situated near the quarries where the ships were loaded with extracted marble or stone blocks, which were then transported via known maritime routes toward the destined unloading ports, which were spaced all over the Mediterranean.¹ As for the Adriatic basin and its centres, the marbles were mostly imported from the territory of the Aegean coast and from the province of Asia Minor, where various known marbles were discovered and commercially used.

A number of underwater archaeological sites in the Mediterranean confirm the high intensity of trade in such products, which were, due to their weight, often liable to be sunk in wrecks during unfavourable weather conditions and violent storms.² There are numerous underwater sites that contain marble and semi-finished marble products inside the borders of the Croatian territorial sea. Those products were intended to decorate the then luxury villas, palaces, religious and public buildings.³

According to Diocletian's Edict on Maximum Prices (issued in 301 CE)⁴, which among other goods and services included prices for maritime transport, four regular maritime routes that connected Nicomedia, Syria, Africa and Alexandria were known to be important.⁵ In addition to the fact that within the Diocletian's Palace in Split (built between 295-305 CE) 16 different types of imported decorative stone and marble (with their specific prices listed in the Edict) were studied, we can conclude that this valuable material was extensively traded as well as used to decorate the luxurious interior and exterior spaces.⁶

1 POTTER, 2009.

2 PARKER 1992, 580.

3 VRSALOVIĆ 1974, 53, 240.

4 „*Edictum Diocletiani de pretiis rerum venalium*“; PRANTL 2011, 359-398.

5 MARIN 2012, 123-128.

6 MARASOVIĆ, MATETIĆ POLJAK 2010, 89-100.

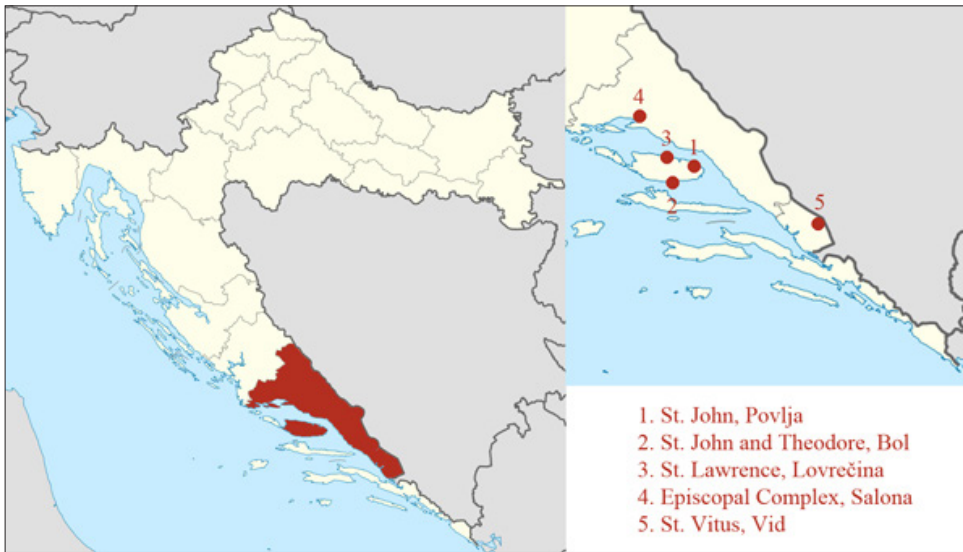


Fig. 1.
Location of the studied sites with faux marbling motifs in Central and South Dalmatia (source: hr.wikipedia, Nikola Radošević)

In the environment of the new spiritual impulse that the new Christian faith had introduced, tectonic movements within the usual symbolism of art forms occurred, radical artistic novelties that were to represent the collective consciousness. Attempts at imitating various forms were elements of artistic expression that should be regarded primarily within the space-time determinism and context. Common forms of faux marbling in the Early Christian period were not necessarily the result of a lack of funding, limited skills or knowledge, but rather part of a conscious choice of visual language. However, the fact remains that during Late Antiquity and the Early Christian period, the production, distribution and supply of all types of marble drastically declined due to inflation and the slow, but inevitable collapse of the Western Roman Empire. Consequently, this had a severe negative effect on the use of stone and marble panels as decorative materials in new buildings.

The term “faux marbling” describes a technique where different types of substrates are painted in order to achieve an effect that mimics the layout of the original stone material. Faux marbling is often executed as a simple form of fresco technique where pigments diluted in lime water or milk are applied on the surface of fresh lime mortar, trying to evoke the texture and exuberant form of certain types of marble. The aim of the artist is usually to get as close to the original marble texture as possible. The pigment was often applied over a lightly toned background with red to brown hues.⁷

Faux marbling motifs identification

The study used several representative examples of faux marbling on a number of sites in Central and Southern Dalmatia. Historical and archaeological sites presented in this paper are the Basilica of St Lawrence, Lovrečina (Brač), the Church of St John and St Theodore in Bol (Brač), the Early Christian baptistery of the Church of St John the Baptist in Povlja (Brač), the remains of the fragments in the Episcopal Complex in Salona (Solin), and the baptismal well at the church of St Vitus (Vid near Metković) (Fig. 1).

During the research phase, selected faux marbling motifs were each compared with several real marble samples that were widely used in antiquity, some of which are found at sites along the eastern Adriatic coast.⁸ Marble samples were compared and selected as a possible source of inspiration for Early Christian period artists, who could use them as templates for their work. Marble samples were chosen according to the following criteria: similarity of colour (both grain and veins), shape of grain and veins, and size ratio of grain and veins.⁹ After the selection, results for each faux marbling motif are shown in the separate tables.

7 MATULIĆ, 78-79.

8 MARASOVIĆ, MATETIĆ POLJAK 2010, 91.

9 Marble samples were not selected by means of measuring the true diameter of grains and number of grains per cm², since it was not possible to precisely evaluate whether Early Christian period artists and craftsmen, if they were using true marble panels as templates, also used an approximation of their original matrix or grain size scale.



Fig. 2. NW panel with remains of fresco painting decorated with faux marbling motifs (St John, Povlja) (photo: T. Borovac, B. Matulić)

Povlja

Church of St John the Baptist¹⁰

Povlja is a small village situated in a deep bay in the north-eastern part of Brač Island. Marbling panels that were discovered in the church of St John the Baptist were part of wall decorations of an Early Christian baptistery from the 6th century.¹¹ These representative examples of Early Christian wall decoration were originally painted in the *fresco* and were partially finished in the *secco* method.¹²

Frescoes with a characteristic painted imitation of marble plates and slabs were discovered in each of the four semi-circular niches of the baptistery (Fig. 2).

In each niche the wall is divided into two rectangular panels, which are surrounded with crimson bands. The left panel is encircled by a band decorated



Fig. 3. Detail of SIK_1 motif (St John, Povlja) (photo: T. Borovac, B. Matulić)



Fig. 4. Detail of SIK_2 motif (St John, Povlja) (photo: T. Borovac, B. Matulić)

with an imitation of yellow marble with elongated, oval-shaped grains. The central part of the left field consists of a rectangle with a painted imitation of marble with light tinted pinkish-coloured grains of circular and oval shape, surrounded and enveloped by reddish veins. The right panel is encircled by a band painted dark green. The central area of the right panel is decorated with imitation marble consisting of yellow, oval-shaped grains very similar to those found in the left field. Considering their state of preservation, two samples of faux marbling motifs were chosen for the comparison.

For the first sample (DES SIK_Povlja_1),¹³ depicting marble with light tinted pinkish-coloured grain of circular and oval shape, surrounded and enveloped by reddish veins (Fig. 3), three marble samples were selected and compared within the study phase:

The first was Frigio o Pavonazzetto (Lat. *Marmor Docimium*, *Marmor Synnadicum*, *Marmor Phrygium*) (Asia Minor), the second Breccia corallina (Lat. *Marmor*

10 Croatian; sv. Ivan Krstitelj.

11 JELIČIĆ-RADONIĆ 1992, 143.

12 BOROVIAC, MATULIĆ, 2005.

13 DES – designation, SIK – sveti Ivan Krstitelj (Eng: St. John the Baptist).

<i>Site</i>	<i>Geographical position</i>	<i>Faux marbling sample designation</i>	<i>Marble sample</i>	<i>Marble origin</i>
St John the Baptist (Baptistery)	Povlja Brač island Splitsko-dalmatinska County	SIK_Povlja_1	Frigio o Pavonazzetto (Lat. <i>Marmor Docimium</i> , <i>Marmor Synnadicum</i> , <i>Marmor Phrygium</i>)	Iscehisar Phrygia Asia Minor Turkey
St John the Baptist (Baptistery)	Povlja Brač island Splitsko-dalmatinska County	SIK_Povlja_1	Breccia corallina (Lat. <i>Marmor Sagarium</i>)	Vezirohan Bithynia Asia Minor Turkey
St John the Baptist (Baptistery)	Povlja Brač island Splitsko-dalmatinska County	SIK_Povlja_1	Lumachella rosa	Kairouan North Africa Tunisia

Table 1. Comparison of SIK_Povlja_1 motif with several marble samples from antique quarries

<i>Site</i>	<i>Geographical position</i>	<i>Faux marbling sample designation</i>	<i>Marble sample</i>	<i>Marble origin</i>
St John the Baptist (Baptistery)	Povlja Brač Island Splitsko-dalmatinska County	SIK_Povlja_2	Breccia di Sciro o di Settebasi (Lat. <i>Marmor Scyreticum</i>) Sample 1	Sciro Island Greece
St John the Baptist (Baptistery)	Povlja Brač Island Splitsko-dalmatinska County	SIK_Povlja_2	Breccia di Sciro o di Settebasi (Lat. <i>Marmor Scyreticum</i>) Sample 2	Sciro Island Greece
St John the Baptist (Baptistery)	Povlja Brač Island Splitsko-dalmatinska County	SIK_Povlja_2	Breccia dorata	Montagnola Tuscany Italy

Table 2. Comparison of SIK_Povlja_2 motif with several marble samples from antique quarries

Sagarium), and the third sample selected was Lumachella rosa (North Africa).¹⁴

After studying their colour, grain size and distribution of veins, three samples of marble were chosen for comparison with the second marbling motif (DES SIK_Povlja_2) (Fig. 4). Two samples were of *Breccia di Sciro o di Settebasi* (Lat. *Marmor Scyreticum*), from Sciro Island in Greece. For the third sample, *Breccia dorata* (Italy) was selected.

Bol

Church of St John and St Theodore¹⁵

Marbling wall decorations were preserved on the northern wall of the underground (substructure) chamber, next to the church of St John and St Theodore in Bol, later converted to a water cistern.¹⁶ Modest imitations of marble panelling (*opus sectile marmoreum*) are also present in the frescoes of other early Christian churches on Brač Island.

14 MUSNAF (Museo di Storia Naturale dell'Accademia dei Fisiocritici) Online Catalogue (Catalogo completo-dettagliato della Collezione di Marmi Antichi), 2015.

15 Croatian; sv. Ivan i Teodor.

16 KOVAČIĆ 1986-87, 23-32.



Fig. 5. Remains of fresco decoration (north wall of the sub-structure), St John and St Theodore, Bol (photo: T. Borovac, B. Matulić)

The frescoes were covered to a large extent by a ribbed, barrel-vaulted cistern which was added at a later date.¹⁷

The decoration consists of two rows of rectangular panels surrounded by coloured bands (Fig. 5). The outer band was painted with crimson-brownish pigments. The inner bands, enveloping the central panel, were decorated with an imitation of light, white marble with a water-diluted touch of ochre. The matrix consists of grains, which are oval-shaped and of various, although similar, sizes. The marble veins are painted in red pigment, and in places accented with diluted blue pigment. The central panel consists of a bright ochre background, and was used to represent marble grains of roughly three different sizes. The veins separating marble grains were painted with a crimson pigment that, with the passage of time and in unfavourable conditions, became brownish.

Of the preserved fragments, two of the described faux marbling motifs were selected for comparison with real marble samples.

For the first sample (SIT_Bol_1), imitating light marble enveloped by reddish veins (Fig. 6), three marble samples were selected:



Fig. 6. Detail of SIT_1 motif (St John and St Theodore, Bol) (photo: T. Borovac, B. Matulić)

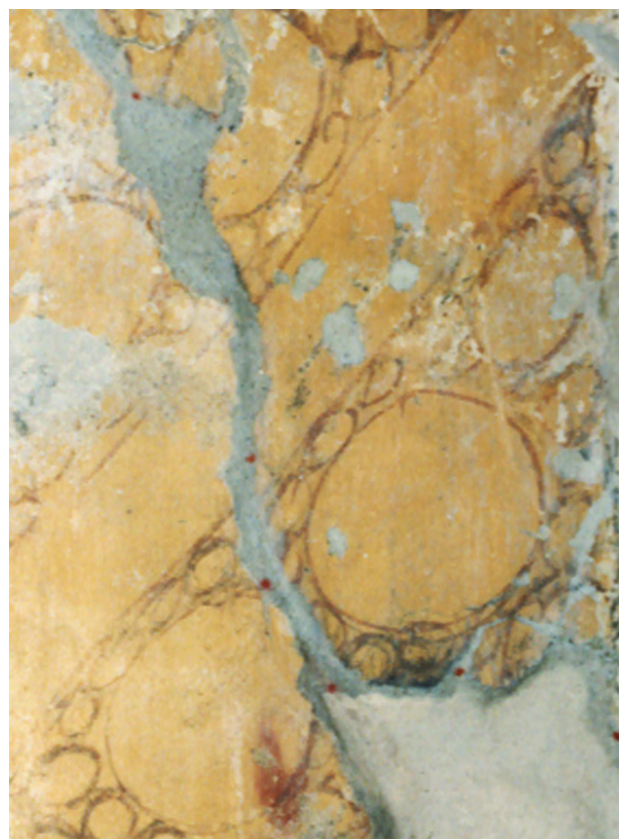


Fig. 7. Detail of SIT_2 motif (St John and St Theodore, Bol) (photo: T. Borovac, B. Matulić)

The first is Breccia di Aleppo from Chios Island, Greece; the second is Pomarolo o Breccia di Arbe, from Rab Island, Croatia, while the third sample is Pavonaz-zetto, Phrygia, Asia Minor (Turkey).

For the second marbling motif (SIT_Bol_2) (Fig. 7) three samples of marble were selected for comparison. Two of the samples selected were variations of Marmo Tri-pontico o Occhio di pavone, var. pavonazza and rosa. The third sample selected was Breccia rossa appenninica (Italy).

17 KOVAČIĆ 1986-87, 23-32.

<i>Site</i>	<i>Geographical position</i>	<i>Faux marbling sample designation</i>	<i>Marble sample</i>	<i>Marble origin</i>
St John and St Theodore (substructure)	Bol Brač Island Splitsko-dalmatinska County	SIT_Bol_1	Breccia di Aleppo	Chios Island Greece
St John and St Theodore (substructure)	Bol Brač Island Splitsko-dalmatinska County	SIT_Bol_1	Pomarolo o Breccia di Arbe	Rab Island Croatia
St John and St Theodore (substructure)	Bol Brač Island Splitsko-dalmatinska County	SIT_Bol_1	Pavonazetto (<i>Lat. Marmor Docimium, Marmor Synnadicum, Marmor Phrygium</i>)	Iscehisar Phrygia Asia Minor Turkey

Table 3. Comparison of SIT_Bol_1 motif with several marble samples from antique quarries

<i>Site</i>	<i>Geographical position</i>	<i>Faux marbling sample designation</i>	<i>Marble sample</i>	<i>Marble origin</i>
St John and St Theodore (substructure)	Bol Brač Island Splitsko-dalmatinska County	SIT_Bol_2	Marmo Tripontico o Occhio di pavone, var. pavonazza (<i>Lat. Marmor Triponticum, Pneunomusium</i>)	Kutluca Izmit Bithynia Asia Minor Turkey
St John and St Theodore (substructure)	Bol Brač Island Splitsko-dalmatinska County	SIT_Bol_2	Marmo Tripontico o Occhio di pavone, var. rosa (<i>Lat. Marmor Triponticum, Pneunomusium</i>)	Kutluca Izmit Bithynia Asia Minor Turkey
St. John and Theodore (substructure)	Bol Brač Island Splitsko-dalmatinska County	SIT_Bol_2	Breccia rossa appenninica	La Spezia Liguria Italy

Table 4. Comparison of SIT_Bol_2 motif with several marble samples from antique quarries



Fig. 8. Remains of fresco painting (north wall of the Baptistery), St Lawrence, Lovrečina (photo: T. Borovac)

Lovrečina

Basilica of St Lawrence¹⁸

The Bay of Lovrečina is situated along the northern shore of Brač Island, approximately 2.2 km south-east from the village of Postira. The bay is important because of its complex and rich history and archaeological sites, which include the remains of a Roman *villa rustica* in the central part of the bay, and an Early Christian basilica, of St Lawrence, situated near the western slope of the high ground that surrounds the bay.¹⁹

The frescoes discovered in the early Christian baptistery from the 6th century, which was added as a northern annex to the church of St Lawrence, have been partially preserved at a height of about 20 cm above the ground level (Fig. 8).

Based on the conservation documentation and using a comparison with the example of faux marbling decoration found in the underground chamber in Bol, we can

presume that the rectangular fields above the greyish stripes were decorated with faux marbling depicting marble plates (Fig. 9). The remains of the fresco have to be subjected to conservation work and cleaning, and it was impossible to document the details of the marbling motif in its current condition.

Episcopal complex in Salona

Baptistery complex, east chamber

The Episcopal Complex is located in the northern part of the ancient Roman city of Salona, the present-day Solin. In the baptistery area of the complex (5-6th century CE), a small fragment of fresco decoration is still preserved, although its paint layer and mortar are exposed to various and intense dilapidating processes.²⁰ It is attached to the wall in the north-east corner of the east chamber, where the marbling motif has been painted by the application of red pigment on a light yellow or ochre background, representing marble grains and matrix (Fig. 10).

The only preserved motif from the fragment (DES EC_Salona_1) (Fig. 11) was used for comparison with marbles that were widely used for decorating public and religious buildings during Roman and Early Christian period. Three marble samples that possessed specific similarities with the marbling motif were selected for a comparison. The first was Marmo Tripontico o Occhio di pavone, var. pavonazza (Lat. *Marmor Triponticum, Pneunomusium*) from Asia Minor, the second Breccia di Herake, also from Asia Minor. Breccia corallina (Lat. *Marmor Sagarium*) was, among others, compared and selected as a third marble sample that could have been used as a possible source of inspiration.²¹



Fig. 9. Conservation documentation drawing depicting the remains of the fresco (north wall in the Baptistery), St Lawrence, Lovrečina (drawing: B. Matulić, Croatian Conservation Institute)

18 Croatian; sv. Lovre.

19 JELIČIĆ-RADONIĆ 1992, 133-150.

20 MARDEŠIĆ 2004, 238-240.

21 MUSNAF (Museo di Storia Naturale dell'Accademia dei Fisiocritici) Online Catalogue (Catalogo completo-dettagliato della Collezione di Marmi Antichi), http://www.museofisiocritici.it/risultato_inv.asp?order=0



Fig. 10. Remains of fresco painting with faux marbling motif in the east chamber near the Baptistery (Episcopal complex in Salona) (photo: T. Borovac)



Fig. 11. Detail of EC_Salona_1 motif (photo: T. Borovac)

Site	Geographical position	Faux marbling sample designation	Marble sample	Marble origin
Episcopal Complex in Salona	Salona City of Solin Splitsko-dalmatinska County	EC_Salona_1	Marmo Tripontico o Occhio di pavone, var. pavonazza (Lat. <i>Marmor Triponticum</i> , <i>Pneunomusium</i>)	Kutluca Izmit Bithynia Asia Minor Turkey
Episcopal Complex in Salona	Salona City of Solin Splitsko-dalmatinska County	EC_Salona_1	Breccia di Herake	Herake Izmit Bithynia Asia Minor Turkey
Episcopal Complex in Salona	Salona City of Solin Splitsko-dalmatinska County	EC_Salona_1	Breccia corallina (Lat. <i>Marmor Sagarium</i>)	Vežirhan Izmit Bithynia Asia Minor Turkey

Table 5. Comparison of EC_Salona_1 motif with several marble samples from antique quarries

Vid (Narona)

Church of St Vitus in Vid²²

Today’s village of Vid was founded on the remains of the Roman settlement of Narona, near the delta of the Neretva river. It was part of the Roman province of Dalmatia. The Church of St Vitus is situated in the north-eastern part of the village. The contemporary church was built in the 16th century, over the remains of an older and bigger Early Christian basilica. The basilica was abandoned

simultaneously with the city of Narona in the 5th or 6th century, during the Slavic migrations in the area.²³

During the archaeological excavations during the 1990s (led by Emilio Marin) in the northern annex of the Church of St Vitus an octagonal baptismal well was found (Fig. 12). After archaeological excavations and research, the baptismal well was conserved, documented and reburied. According to the discovered artefacts (coins), it is dated in the 5th century. The octagonal well has three stairs on opposite sides following north-south line. The complete interior, side walls and stairs were

22 Croatian; sv. Vid.

23 MARIN *et al.* 1999.



Fig. 12. Baptismal well decorated with the fresco with faux marbling motifs near the church of St Vitus (Vid) (source: MARIN *et al.* 1999)



Fig. 14. Detail of SV_Vid_1 motif (St Vitus, Vid) (photo: MARIN *et al.* 1999)



Fig. 13. Stairs in the baptismal well painted with faux marbling motifs (church of St Vitus, Vid) (source: MARIN *et al.* 1999)



Fig. 15. Detail of SV_Vid_2 motif (St Vitus, Vid) (photo: MARIN *et al.* 1999)



Fig. 16. Detail of SV_Vid_3 motif (St Vitus, Vid) (photo: MARIN *et al.* 1999)

<i>Site</i>	<i>Geographical position</i>	<i>Faux marbling sample designation</i>	<i>Marble sample</i>	<i>Marble origin</i>
St Vitus Church (baptismal well)	Vid Dubrovačko-neretvanska County	SV_Vid_1	Pavonazetto (<i>Lat. Marmor phrygium, Synnadicum, Docimenium</i>)	Iscehisar Phrygia Asia Minor Turkey
St Vitus Church (baptismal well)	Vid Dubrovačko-neretvanska County	SV_Vid_1	Marmo Tripontico o Occhio di pavone, var. Rosa (<i>Lat. Marmor Triponticum, Pneunomusium</i>)	Kutluca Izmit Bithynia Asia Minor Turkey

Table 6. Comparison of SV_Vid_1 motif with several marble samples from antique quarries

<i>Site</i>	<i>Geographical position</i>	<i>Faux marbling sample designation</i>	<i>Marble sample</i>	<i>Marble origin</i>
St Vitus Church (baptismal well)	Vid Dubrovačko-neretvanska County	SV_Vid_2	Breccia dorata Sample 1	Montagnola Tuscany Italy
St Vitus Church (baptismal well)	Vid Dubrovačko-neretvanska County	SV_Vid_2	Breccia dorata Sample 2	Apua Alps Lucca Italy

Table 7. Comparison of SV_Vid_2 motif with several marble samples from antique quarries

<i>Site</i>	<i>Geographical position</i>	<i>Faux marbling sample designation</i>	<i>Marble sample</i>	<i>Marble origin</i>
St Vitus Church (baptismal well)	Vid Dubrovačko-neretvanska County	SV_Vid_3	Marmo Caristio o Cipollino verde (<i>Lat. Marmor Carystium, Marmor Styrium</i>)	Styra and Karystos Euboea Greece
St Vitus Church (baptismal well)	Vid Dubrovačko-neretvanska County	SV_Vid_3	Marmo Cipollino marino	Apua Alps Lucca Italy

Table 8. Comparison of SV_Vid_3 motif with several marble samples from antique quarries

Site	Geographical position	Faux marbling sample designation	Marble sample	Marble origin
St John the Baptist (baptistery)	Povlja Brač Island	SIK_Povlja_1	Lumachella rosa	Kairouan North Africa Tunisia
St John the Baptist (baptistery)	Povlja Brač Island	SIK_Povlja_2	Breccia di Sciro o di Settebasi (Lat. <i>Marmor Scyreticum</i>)	Sciro island Greece
St John and St Theodore (substructure)	Bol Brač Island	SIT_Bol_1	Pomarolo o Breccia di Arbe	Rab island Croatia
St John and St Theodore (substructure)	Bol Brač Island	SIT_Bol_2	Marmo Tripontico o Occhio di pavone, var. rosa	Kutluca , Izmit Bithynia Asia Minor Turkey
Episcopal Complex in Salona (baptistery, east chamber)	Salona City of Solin	EC_Salona_1	Breccia corallina (Lat. <i>Marmor Sagarium</i>)	Vezirhan, Izmit Bithynia Asia Minor Turkey
St Vitus Church (baptismal well)	Vid	SV_Vid_1	Pavonazetto (Lat. <i>Marmor Phrygium</i>)	Iscehisar Phrygia Asia Minor Turkey
St Vitus Church (baptismal well)	Vid	SV_Vid_2	Breccia dorata Sample 2	Apua Alps Lucca
St Vitus Church (baptismal well)	Vid	SV_Vid_3	Marmo Caristio o Cipollino verde (Lat. <i>Marmor Carystium</i>)	Styra and Karystos Euboea Greece

Table 9. Final selection of the marble samples with their faux marbling motif equivalents presented in the study

decorated with a painted imitation of different types of marble made in the fresco technique. It was possible to select samples of three different types of faux marbling.

The three stairs, descending from the top to the bottom of the well, were decorated with marbling motif depicting a composite marble with numerous irregular horizontal layers in different shades of black, blue and green (Fig. 13). The panel on the left side was decorated with marbling of various-sized oval grains with stylised peacock eyes in red and green pigment, divided by a net of thin black veins. The panel on the right side was decorated with irregular, oval-shaped dark yellow grains, divided by a net of purplish-black veins.

Three of the motifs were preserved well enough for them to be used in comparative research.

Each motif was compared with several types of marbles used in antiquity. For a closer selection two samples of marble per motif were introduced. The first

motif (DES SV_Vid_1) (Fig. 14) was compared with Pavonazetto (Lat. *Marmor phrygium*, *Synnadicum*, *Docimenium*) (Asia Minor), and Marmo Tripontico o Occhio di pavone, var. Rosa (Lat. *Marmor Triponticum*, *Pneunomusium*) also from Asia Minor.

The second motif selected (DES SV_Vid_2) (Fig. 15) was compared with two samples of Breccia dorata originating from two different geographical locations within the same country (Italy).

The third motif (DES SV_Vid_3) (Fig. 16) was compared with two types of Marmo Cipollino, the first being Marmo Caristio o Cipollino verde, originating from Euboea, Greece, the second being Marmo Cipollino marino from Lucca, Italy.





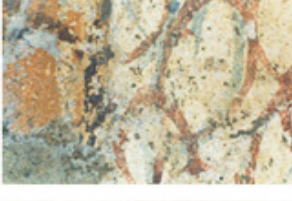



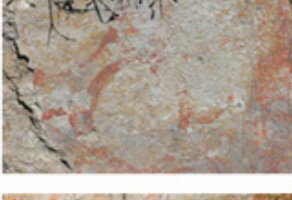
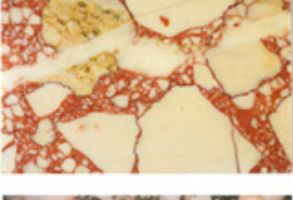

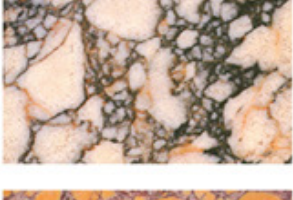
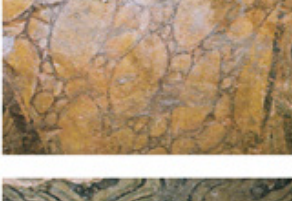
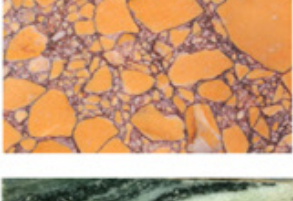


<i>Faux marbling motif</i>	<i>Faux marbling motif designation</i>	<i>Marble sample</i>	<i>Marble sample name and origin</i>
	SIK_Povlja_1		Lumachella rosa Kairouan North Africa Tunisia
	SIK_Povlja_2		Breccia di Sciro o di Settebasi (lat. Marmor Scyreticum) Sciro Island Greece
	SIT_Bol_1		Pomarolo o Breccia di Arbe Rab Island Croatia
	SIT_Bol_2		Marmo Tripontico o Occhio di pavone, var. rosa Bithynia Asia Minor Turkey
	EC_Salona_1		Breccia corallina (lat. Marmor Sagarium) Bithynia Asia Minor Turkey
	SV_Vid_1		Pavonazetto (lat. Marmor Phrygium) Phrygia Asia Minor Turkey
	SV_Vid_2		Breccia dorata Sample 2 Apua Alps Lucca Italy
	SV_Vid_3		Marmo Caristio o Cipollino verde (lat. Marmor Carystium) Styra and Karystos Greece

Fig. 17. Faux marbling motifs overview with marble samples that were used as probable templates, final selection (sources: MUSNAE, Università dei Marmorari di Roma, B. Matulić, T. Borovac, E. Marin)

Conclusion

Within the usual symbolism of art forms, Christianity brought great and radical artistic novelties that were to represent the collective consciousness. The frequent use of faux marbling decoration in the early Christian period is not necessarily the result of a lack of resources, but part of a conscious choice of visual language. However, it is a fact that the production, distribution and demand for all types of marble were drastically reduced in that period. All of this resulted in the intensified use of the faux marbling technique during the Early Christian period in Central and South Dalmatia.

According to comparison of the frescoes and natural marble presented, the final selection in the study identified following marbles that were used as templates for executing faux marbling motifs in the cases presented: Occhio di pavone, Pavonazetto, Breccia Coralina, Breccia dorata, Breccia di Sciro, Breccia di Arbe, Lumachella rosa, Cipollino verde²⁴ (Fig. 17).

Difficulties in the study were mainly associated with identifying and relating true marble and stone samples with somewhat stylised faux marbling artistic interpretations.

Early Christian artisans and artists might have seen most of the natural marbles as part of already ancient decorations that were displayed in their nearby environment, and used them, although more or less stylised, in their work. It is also possible that they might have reused already existing examples of faux marbling wall decorations as inspiration, adding their own unique interpretation and form to the existing palette of motifs.

BIBLIOGRAPHY

- JELIČIĆ-RADONIĆ J. 1992: "Ranokršćanske freske u Lovrečini na Braču", PPUD 32, Split, 133-150.
- KOVAČIĆ V. 1986-87: "Kasnoantička cisterna u Bolu na Braču", PPUD 26, Split, 23-32.
- MARASOVIĆ K., MATETIĆ POLJAK D. 2010: "Upotreba dekorativnog kamena u Dioklecijanovoj palači u Splitu", *Histria Antiqua* 19, Pula.
- MARDEŠIĆ J., CHEVALIER P. 2004: "Revizijska iskopavanja u Saloni – Oratorij A", *Hrvatski arheološki godišnjak*, (2004.), 1, 238-240.
- MARIN E. *et al.* 1999: *Sveti Vid*, Arheološki muzej, Split
- MARIN E. 2012: "Moguće pomorske komunikacije starokršćanske Salone", *Histria Antiqua* 21, 123-128.
- MATULIĆ B. 2012: *Temeljni pojmovi konzervacije-restauracije zidnih slika i mozaika*, Naklada Bošković, Split.
- MATULIĆ B., BOROVIĆ T. 2002-05 (unpublished): *Conservation-restoration works in parish church of St. John the Baptist in Povlja*. Croatian Conservation Institute, Split
- PARKER A. J. 1992: *Ancient Shipwrecks of the Mediterranean & the Roman Provinces*, *Bar International Series*, Oxford, 580.
- POTTER D. S. 2009 (ed): *A Companion to the Roman Empire*, Wiley-Blackwell.
- PRANTL M. 2011: "Diocletian's Edict on Maximum Prices of 301 AD, A fragment found in Aigeira", *historia.scribere* 3 (2011), 359-398.
- VRŠALOVIĆ D. 1974: *Istraživanja i zaštita podmorskih arheoloških spomenika u SR Hrvatskoj*, Zagreb.
- MUSNAF (Museo di Storia Naturale dell'Accademia dei Fisiocritici): *Online Catalogue (Catalogo completo dettagliato della Collezione di Marmi Antichi)*, http://www.museofisiocritici.it/risultato_inv.asp?order=0, 2005/16.
- Università dei Marmorari di Roma (Elenco Campionario Marmi): *Online catalogue*, <http://www.universitadeimarmorari.it/campionario.html>, 2015.

24 Most of the marble samples used in the study are part of the MUSNAF (Museo di Storia Naturale dell'Accademia dei Fisiocritici) Online Catalogue (Catalogo completo-dettagliato della Collezione di Marmi Antichi), http://www.museofisiocritici.it/risultato_inv.asp?order=0, and Università dei Marmorari di Roma (Elenco Campionario Marmi – Online catalogue), <http://www.universitadeimarmorari.it/campionario.html>

Also, many thanks to prof. Ivo Donelli from the Department for Conservation and Restoration of Stone from the Arts Academy Split for his expertise and for the marble samples he presented to us during the study phase.