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

Gobić-Bravar, Đeni

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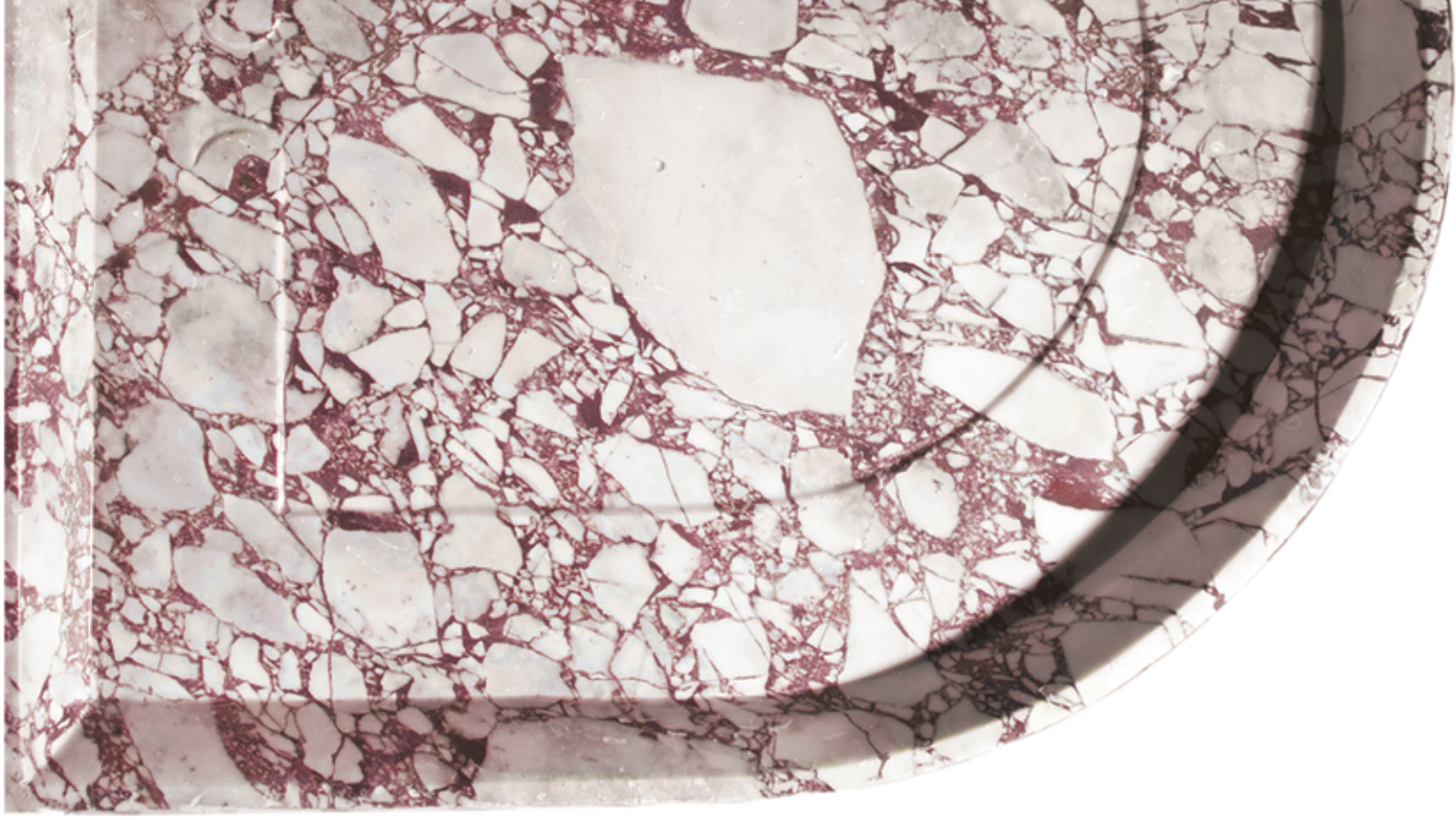


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MARBLE SLABS USED AT THE ARCHAEOLOGICAL SITE OF SORNA NEAR POREČ ISTRIA – CROATIA

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Abstract

The Sorna peninsula near the town of Poreč was excavated in the years 1966 to1968. 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 microcrystalline 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 20th 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 to1968 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)



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

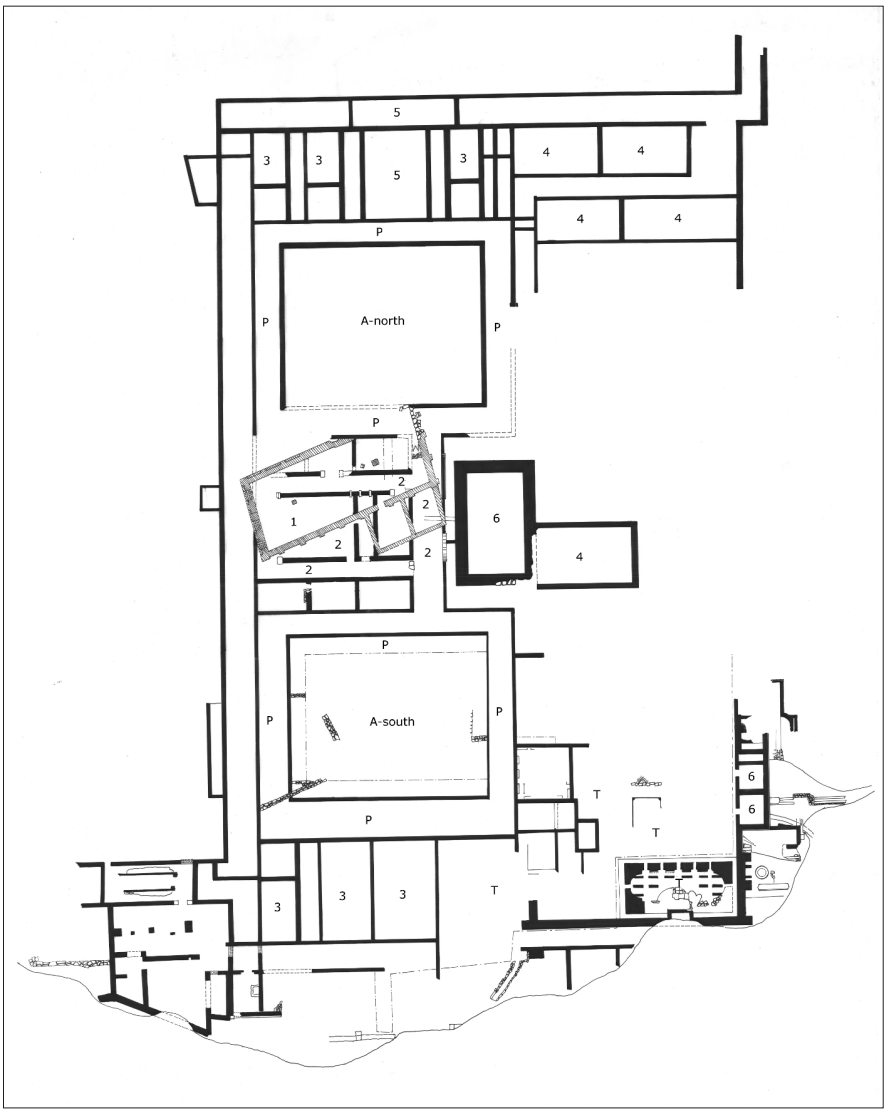


Fig. 3.
Plan of the Roman villa at Sorna
(from documentation archive of AMI).
A – atrium,
P – peristyle,
T – thermal complex,
1 – central complex of the villa,
2 – rooms with mosaics,
3 – residential spaces,
4 – storage spaces,
5 – main northern entrance,
6 – water reservoirs

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 1st or beginning of the 2nd century and was occupied, with small interventions, until the 5th century (Fig. 3).[1]

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.[2] 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[3], 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)

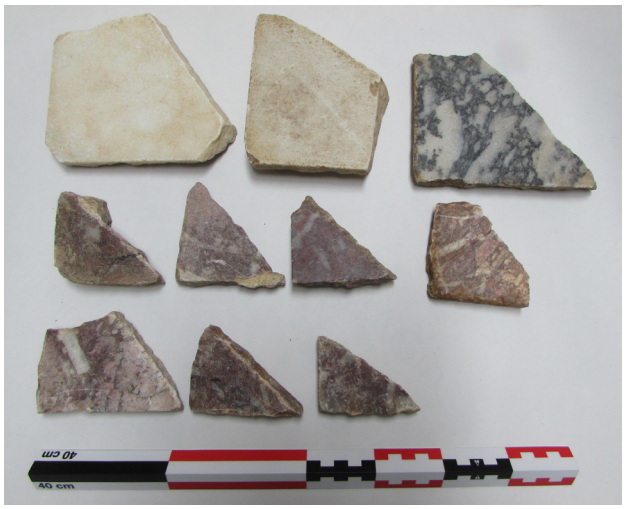


Fig. 5. Triangular marble slabs (photo: Đ. Gobić-Bravar)

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[4] and catalogues[5]. 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/; MUSNAF, www.museofisiocritici.it.



Fig. 7. Moulded marble 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. 9. The thick *marmor phrygium* block and the only two other examples of *marmor phrygium* slabs (photo: Đ. Gobić-Bravar)



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*

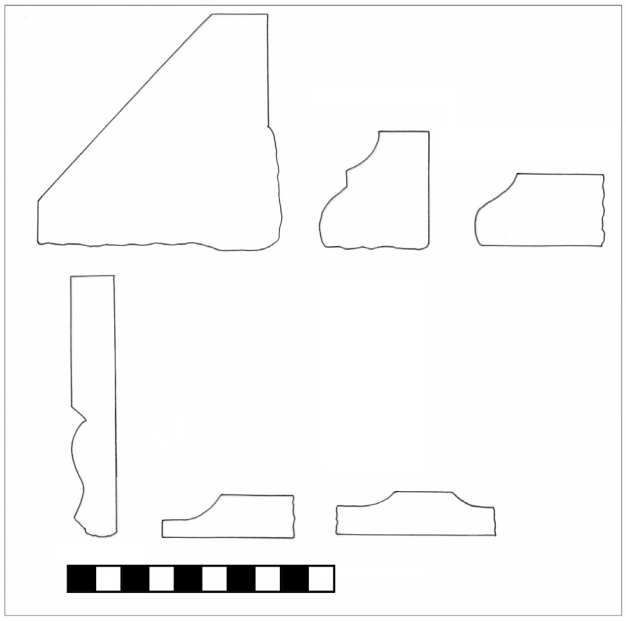


Table 1. Marble mouldings from the Roman villa in Sorna



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[6].

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*.



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[7], 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.

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

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)



Fig. 14. Two marble slabs with original, ancient, repairs (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[8] 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[9]. 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 (mastice), 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. 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.[10] 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.