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INSIDE THE GOVERNOR'S PALACE AT APULUM: A PRELIMINARY STUDY OF SPACE, FUNCTION, AND DECORATIVE EXPRESSION WITH AN EMPHASIS ON MARBLE USE

Cristina-Georgeta Alexandrescu, with an Appendix on marble provenance analyses by Walter Prochaska and Vasiliki Anevlavi[1]

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Abstract: From the late second century AD, archaeological and epigraphic evidence attests to a major architectural complex within the *canabae legionis* at Apulum, likely the *praetorium consularis*, residence and headquarters of the Roman provincial governor in Dacia. Despite excavation challenges due to the modern city of Alba Iulia, a variety of decorative materials have been recovered - marble flooring and wall revetments, mosaics, stucco, and terracotta pavements - many from secondary contexts and previously understudied. This project re-examines these fragments, drawing on material from 19th-century digs, recent rescue excavations, and earlier research. Emphasis is placed on analyzing the technical and material aspects of interior decoration, particularly the sourcing and use of both local and imported marble categories. The presence of high-quality finishes and evidence of skilled workmanship, including input from northern Italy and Asia Minor, points to a well-developed decorative program. Ultimately, the study of interior decoration at the *praetorium consularis* not only advances our understanding of the complex's spatial organization and chronological development, but also contributes to wider inquiries into the economic, cultural, and administrative structures of Roman Dacia.

Keywords: *Dacia, Apulum, praetorium consularis, marble provenance, interior decoration.*

INTRODUCTION – INVESTIGATED AREAS AND RESEARCH QUESTIONS

The Roman province of Dacia, and particularly the military and urban center of Apulum, requires little introduction in this context. However, to examine the economy of the Roman stone trade - especially the import of marble for architectural decoration, finished objects, and the role

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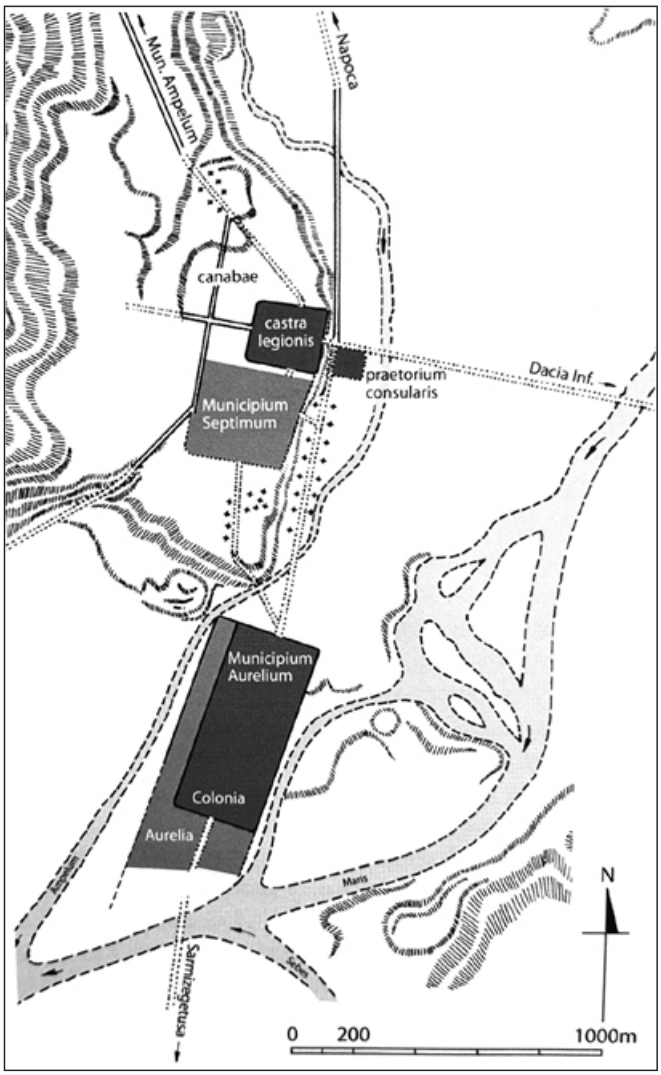

Fig. 1. Roman Apulum (Alba Iulia): *castra*, *canabae*, urban nuclei, and the *praetorium consularis* east–southeast of the fortress (after SCHÄFER 2012, fig. 280).

of specialized craftsmen - it is essential to consider Apulum's access routes. These likely included connections to the port of Tomis, the province of Lower Moesia, and the Danube river system, as well as integration into broader trade networks linking Dacia with Aquileia and northern Italy.

The research history and major sectors of investigation in the area conventionally associated with the *praetorium consularis* – estimated to have extended over several hectares[2] – have been summarized in recent publications[3]. A 2020 study provided new insights based on previously unpublished excavations[4]. My engagement with this topic began through the work of V. Rusu-Bolindeț, and the present study reports exploratory research into the interior decoration of the governor's palace[5]. This investigation started with the analysis of approximately thirty marble fragments and artifacts recovered from the 15–17 Munteniei Street area (Fig. 2/no. 4), generously made available for preliminary study[6].

Despite Apulum's prominence and rich epigraphic record, archaeological research on its structures faces challenges due to later overbuilding and an often indifferent local attitude toward ancient remains. While the location of the *praetorium consularis* within the *canabae legionis* and the primarily epigraphic evidence supporting its identification have been addressed in earlier studies[7], its proximity to necropoleis, urban and peri-urban structures, and key access roads[8] remains highly relevant. This spatial context is crucial not only for understanding the dynamics of the site but also for interpreting the systematic reuse of building materials – from antiquity through the modern era – and the interest in statues and inscriptions displayed by 18th - 20th century collectors. Historical reports as well as recent rescue excavations (not yet published) indicate that marble artifacts were sometimes gathered for lime production, further complicating provenance assessments and fragment interpretation.

As with many studies on Roman Apulum, research into the palace's interior decoration must begin with A. Cserni's work in the building complex he initially identified as 'the Apulum *thermae*' (Fig. 2/no. 1). To interpret recent discoveries, a reassessment of both the sector excavated by Cserni and the artefacts and features he documented is essential.

The comprehensive systematization of building structures uncovered by Cserni, along with the associated data on building phases and repairs, as proposed by F. Schäfer[9], remains an indispensable tool for orientation. Schäfer renumbered the structures within Cserni's excavations sector (Fig. 3), identifying 263 architectural units, including rooms, corridors, courtyards, streets, heating systems, and sewage installations, organizing them into seven building groups (Modules A to I). He identified two main occupational phases: an early period in the second century AD (prior to palace construction) and a later phase extending from the mid-second to mid-third century AD[10].

Noteworthy features include numerous heated rooms, likely used as offices or *scholae* of the *officium consularis*, along with meeting spaces (*e.g.*, Rooms 3 and 221) and a

[2] See, for the data on the state of research and discussions on the matter, SCHÄFER 2014, 272, 339.
[3] SCHÄFER 2014, 264-287, 442-451; RUSU-BOLINDEȚ 2019, with the bibliography.
[4] OTA *et alii* 2020, 150-153: for example the rescue excavations in the area marked on Fig. 2/no. 6.
[5] I am grateful to R. Ota, G. Bounegru, and D. Anghel (Alba Iulia), G. Băeștean (Sarmizegetusa), S. Nemeti (Cluj-Napoca), C. Timoc (Timișoara), D. Matei and C. Dragomir (Turda) for kindly facilitating access to materials, sharing provenance details, and offering insightful discussions during the documentation process.
[6] The preliminary results presented here were first communicated at the international conference "Roman Governors' Residences in an International Comparison," held in Cologne, Germany, on 8–11 October 2024 and organised by the MiQua · LVR-Jüdisches Museum im Archäologischen Quartier Köln and the Römisch-Germanisches Museum. Owing to the length of the contribution, only an extended abstract was included in the conference proceedings Gugl, C./ Havas, Z./ Ristow, S./ Schäfer, A. (eds.), Römische Statthaltersitze im internationalen Vergleich, (forthcoming).
[7] See, for an overview, DIACONESCU/PISO 1993; Ota 2012, 123-133; SCHÄFER 2014, 271-272; RUSU-BOLINDEȚ 2019; BĂRBULESCU 2025, 142-146.
[8] See, for a detailed analysis, SCHÄFER 2014, 271-272; RUSU-BOLINDEȚ 2019.
[9] SCHÄFER 2014, 264-287, 442-451, with fig. 281 and 285.
[10] SCHÄFER 2014, 272-284, with fig. 281.

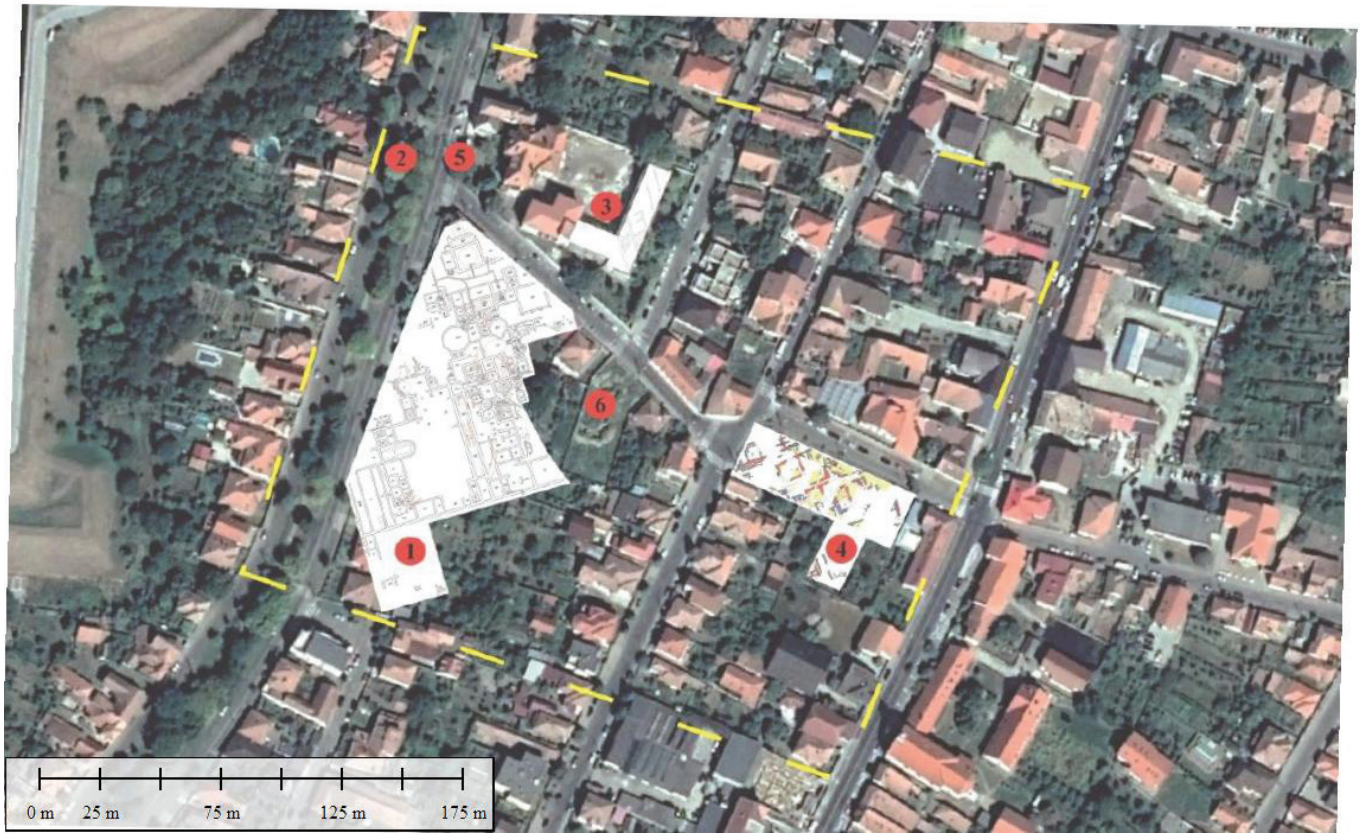

Fig. 2. Alba Iulia, the area of the *praetorium consularis* with investigated sectors (C.-G. Alexandrescu, IABVP, georeferenced image, adapted from OTA et alii 2020, pl. I).

baths complex in Module C. Terracotta tile pavements and brick floors are especially noted in Modules B and D[11]. In Module A, inscriptions (IDR III 5.1, 68–71) and architectural remains suggest an Epona shrine near Room 76[12]. Module G is characterized by the absence of hypocausts. Module E may have functioned as a sanctuaries area[13], with colonnaded façades and monumental entrances (*e.g.*, Room 251) associated with inscriptions. Module F, based on an inscription dedicated by *speculatores* (IDR III 5.2, 426) in Room 214, likely housed administrative offices.

Schäfer identified Rooms 63 and 94 as probable entrance points at the complex's southern edge. Although the shortly investigated area to the south suffered considerable damage, Cserni noted there the presence of similar finds to those in the main structures[14], indicating the need for further archaeological work. The so-called "modules" of the *praetorium* are heterogeneous, and deciphering their spatial relationships, chronology, and functional distinctions remains a significant challenge, made more complex by incorporating data from 20th and 21st century rescue excavations (Fig. 2/no. 2–6).

A small-scale rescue excavation in 1943 near the railway lines, in the northern part of the site (Fig. 2/no. 2), revealed a large Roman structure with floor heating, red-painted walls, and stucco decoration. Two building phases were noted, dated, based on associated inscriptions and coins[15], one in the early second century AD and another in the third century.

Another excavation in 1962, under what is now the Economic High School (Fig. 2/no. 3), revealed heated rooms and an altar dedicated to Minerva by the *exceptores consularis* (IDR III.5, 263), suggesting the presence of a *schola*. Most strikingly, 77 bronze statue fragments[16] – likely a scrap hoard rather than remnants of *in situ* statuary – were discovered. While epigraphic analysis seeks to reinforce the association of this sector with the *praetorium consularis*, the archaeological evidence establishing a direct link to Modules H and I in Cserni's excavation area[17] remains inconclusive. The inscription IDR III 5.1, 266 was found in Room 228 (Module E), at some distance from the 1962 sector. As the altar dedicated by the *exceptores consularis* was uncovered before formal excavation, its context is uncertain, and secondary use as building material cannot be excluded.

The ongoing excavation in the 15–17 Munteniei Street sector (Fig. 2/no. 4) has enabled a more systematic stratigraphic analysis, identifying three major building

[11] SCHÄFER 2014, fig. 285.
[12] SCHÄFER 2014, 277-278.
[13] The identification of certain structures relies on Cserni's interpretations—*e.g.*, a possible Mithraeum and Nemeseum—and on epigraphic evidence, including an inscription (IDR III 5.1, 295) mentioning a temple built *a novo ex viso* by the *beneficiarius* Terentius Marcianus.
[14] CSERNI 1891.
[15] OTA 2012, 131.
[16] OTA *et alii* 2020, 166-168. – In Room 249 of Module E, Cserni discovered a gilded bronze foot wearing a *calceus* (SCHÄFER 2014, fig. 289). However, caution is needed in associating building modules with movable finds, especially objects prone to reuse or relocation.
[17] OTA *et alii* 2020, 164-165.

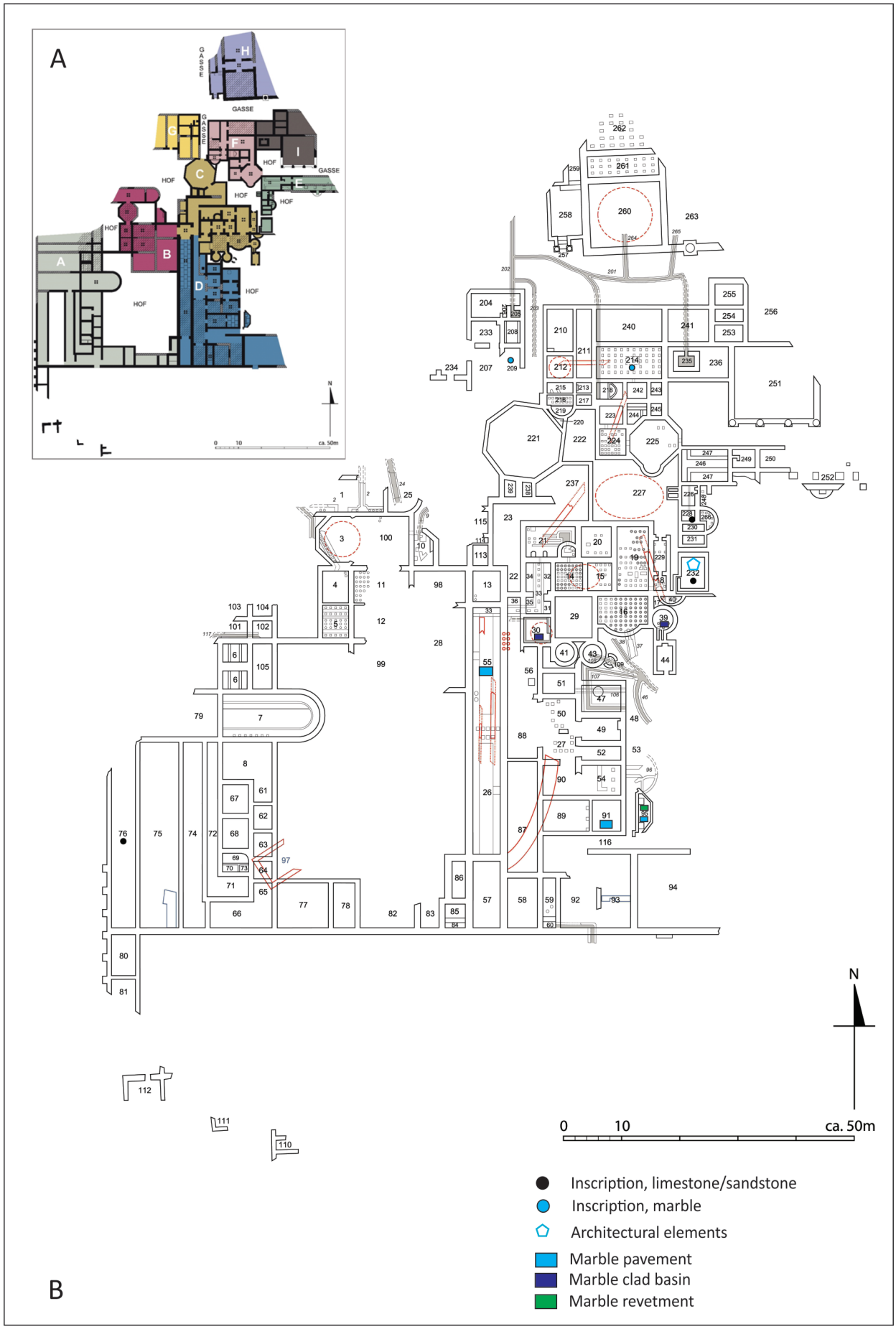

Fig. 3. Alba Iulia, excavations conducted by A. Cserni, systematized by F. Schäfer (A – after SCHÄFER 2014, fig. 285), with mapped marble finds and inscriptions (C.-G. Alexandrescu, IABVP, adapted from SCHÄFER 2012, fig. 281).

phases (Fig. 4)[18]. The area south of both Munteniei Street and Cserni's excavations holds significant potential for future research. Equally promising is the systematic study of museum-held artefacts, which may yield critical insights into this monumental complex. Despite substantial challenges, the *praetorium consularis* emerges as a meticulously designed and maintained administrative center, supporting the operations of the provincial governor and his staff.

A comprehensive reevaluation of all decorative elements (floors, wall revetments, architectural finishes) is essential for reconstructing building phases, spatial hierarchies, and functional zoning. At present, correlating the various excavated sectors of the palace remains difficult and requires detailed study of both stratigraphy and movable finds. Although locating artefacts in museum collections is often problematic, A. Cserni's documentation, particularly his records of materials, techniques, forms, and dimensions, remains indispensable.

In his 1892 report[19], Cserni offered an overview on the building materials used in the palace, noting local sedimentary stones from Șard and Ighiu, marble from the Bistra Valley, and ceramic building materials produced locally. A thorough, updated synthesis of construction materials and techniques at Apulum, extending beyond the *praetorium*, is urgently needed. This should include the selection and use of lithic materials, the ceramic building materials, and construction techniques in walls, floors, hypocausts, and sewage systems. Special attention should be paid to reuse practices and identifying spolia. Establishing this technical baseline is crucial for advancing understanding of interior decoration in both public and domestic spaces, including floors, walls, and movable elements. Such analysis may highlight building phases, renovations, and functional differentiation of architectural spaces.

While the present research project focuses on marble finds, it was deemed essential to briefly consider the decorative strategies observed in the palace's wall and floor finishes - frequent applications for marble. Notably, marble did not serve a structural role in the palace; rather, local stones were used for construction and architectural ornamentation.

WALL PAINTINGS AND STUCCO

The significance and quantity of mural painting and stucco fragments uncovered during Cserni's excavations at Apulum were emphasized in his reports[20]. However, it remains uncertain how many of these fragments were

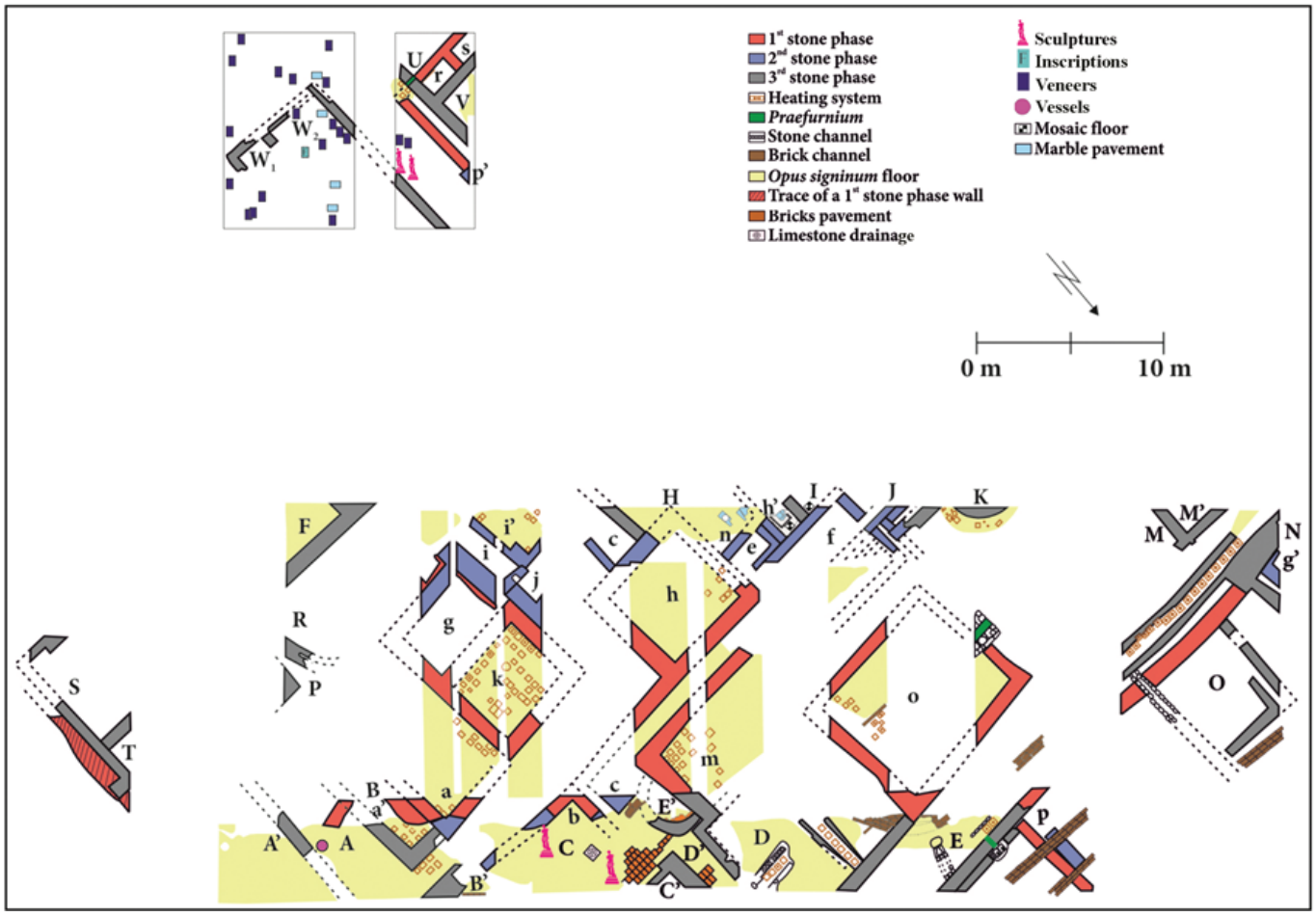

Fig. 4. Alba Iulia, sector at 15-17 Munteniei Street with mapped marble finds from 1992–2021 (V. Rusu-Bolindeț, A. Bâlc, MNIT).

[18] RUSU-BOLINDEȚ 2019, 105-111.
[19] CSERNI 1891, 9-10. See, also, SCHÄFER 2014, 276.
[20] For an overview of the information from the published reports, see SCHÄFER 2014.

Fig. 5. Alba Iulia, stucco fragments from Cserni's excavations, MNUAI inv. no 2955 (C.-G. Alexandrescu, IABVP).

actually recovered and whether they are preserved in current museum collections. A stucco cornice fragment attributed to Cserni's excavations, currently held in the National History Museum in Bucharest[21], underscores the challenges of identifying and retrieving such early finds.

In the sector at 15–17 Munteniei Street (Fig. 2/no. 4), fragments of polychrome wall painting featuring geometric and vegetal motifs were identified, though no stucco remains were reported.

More recently, a selection of wall painting and stucco fragments from a small area excavated in 1962 (Fig. 2/ no. 3) was published, including analytical data on the materials and techniques employed[22]. The so-called "Room with Fresco" in Building II[23], uncovered by I. Berciu during the same campaign, remains the most complex example of *in situ* polychrome wall decoration discovered to date at the site. A detailed examination of these remains, including 22 stucco fragments, highlighted the intricate nature of the original decorative program[24]. Some of these stucco pieces published in 2020, however, may originate from earlier excavations, i.e. sectors[25], given inconsistencies in their inventory numbers and their absence from the 1962 documentation.

Comparable finds of stucco fragments have been published from Potaissa[26], Ulpia Traiana Sarmizegetusa[27] and other areas of Apulum[28]. Nonetheless, systematic studies examining production technology, ornamental schemes, and their integration within broader wall or ceiling programs remain notably scarce. It is particularly noteworthy that the stucco fragments from Apulum appear to be the only examples in Roman Dacia featuring figural decoration: a frieze with running or fighting animals (Fig. 5).

Due to the relatively low preserved height of walls in the excavation, documentation is largely limited to the lower decorative registers. Frequently encountered motifs include monochrome painted fields - typically in red, pink, or blue[29]- as well as polychrome figural compositions and imitations of marble revetment, often rendered as rectangular panels in the lower zones[30].

MARBLE REVETMENTS, MARBLE FLOORING AND MOSAIC PAVEMENTS

Cserni's excavation reports offer valuable insight into the architectural finishes of the governor's palace, including evidence for marble wall revetments and marble flooring (Fig. 3). Although these elements often survive only in a fragmented state, and sometimes as reused material, they remain essential for reconstructing the building's original decorative schemes and later construction phases.

According to Cserni, marble revetments were employed in Room 95, with further marble basin cladding identified in Rooms 30 and 39 (the baths in Module C). Marble slab flooring was recorded in Rooms 55, 91, and again in Room 95 (Module D; Fig. 3)[31]. Room 95 is particularly notable for its elaborate marble decoration and its distinctive layout, though its function remains unresolved. Marble pavement remains were also identified in Rooms 15 and 16 (Module C), though their *in situ* condition is uncertain[32]. Room 16 contained a pavement composed of dogbone-shaped tiles and, in its southern area, marble (pavement?) fragments and wall painting remains[33].

[21] BÂLTÂC *et alii* 2015, cat. no. 263.
[22] OTA *et alii* 2020.
[23] OTA *et alii* 2020, 159, 168-172.
[24] OTA *et alii* 2020, 177-178, 182-184.
[25] Only three fragments from the 1890 campaign are illustrated (CSERNI 1891, 39, pl. V). From the 1943 excavation (Fig. 2/no. 2), I. Berciu also notes stucco finds, which he attributes to ceiling decoration (BERCIU 1949, 197).
[26] BĂRBULESCU 2015, 199-203; BĂRBULESCU 2025, 350-351.
[27] ALICU 1980, 460-461.
[28] For a short overview, see: OTA *et alii* 2020, 170-172 (wall paintings), 172-173 (stucco).
[29] Mentioned, for example, in Room 29, Module C, and in the small baths within Module F (Rooms 215, 216, 219): SCHÄFER 2014, 283; further in the sector Fig. 2/no 2, uncovered in 1943 (BERCIU 1949, 197), but also in the sector from 1962 (Fig. 2/no 3): OTA *et alii* 2020, 159.
[30] In the octagonal Room 3: SCHÄFER 2014, 278; in the "Room with fresco" in Building II within the 1962 sector: OTA *et alii* 2020, 159.
[31] SCHÄFER 2014, 286-287.
[32] CSERNI 1891, 17.
[33] CSERNI 1891, 19.

Fig. 6. Alba Iulia, marble revetment elements from Cserni's excavations: A - MNUAI inv. no 4096; B - MNUAI inv. no 4094 (C.-G. Alexandrescu, IABVP).

Cserni's 1892 report offers detailed observations on the cold and warm bathing pools in Rooms 30 and 39, noting the use of marble slabs and cornices, and describing the bedding layers of removed slabs, including visible mortar joints[34]. A preserved slab measuring 4845 cm² likely had original dimensions of approximately 60 × 80 cm or 50 × 96.9–100 cm.

Three decorative marble elements recovered by Cserni, a pair of revetment slabs (Fig. 6)[35] and a fragment of a Corinthian incrustation capital (Fig. 7)[36], are now preserved in the museum at Alba Iulia. Slab inv. no. 4096 (Fig. 6-A) features two profiled registers: an upper register decorated with a crater motif and a lower register possibly bearing a guilloche. The second slab (Fig. 6-B) features a common guilloche motif within a single register. Based on these decorations, the initial plate widths may be reconstructed at about 27.8 cm. The incrustation capital fragment measures about 39 cm in width. All three objects are carved from locally sourced Bucova marble[37] and exhibit high craftsmanship. While the capital's reverse remains rough (Fig. 7), the slabs' backs are smoothed, bearing fine saw marks.

Although not explicitly identified by Cserni as revetments, slabs inv. nos. 4095 and 4096 may correspond to two decorative spolia reused in Rooms 15 and 18 of the baths in Module C[38]. The spiral and vegetal designs described by Cserni likely match the guilloche and crater motifs of these slabs. The pinkish-yellow mortar adhering to inv. no. 4096 supports this hypothesis. Similarly, the capital fragment may correspond to an architectural spolium recorded in wall 'e', near Room 39[39].

Cserni also noted reused materials and earlier construction phases beneath various baths rooms. He concluded that Rooms 15, 16, 18, and 21 incorporated reused architectural elements (marble slabs, and possibly even statuary) suggesting that the baths were erected in a later construction phase, post-238 AD, during the reign of Decius[40]. This conclusion warrants critical reevaluation

[34] CSERNI 1892, 20-21.
[35] MNUAI inv. no. 4096 (Fig. 6-A): dimensions preserved height 34.2-41.5 cm, preserved width 15.7 cm, thickness 2.4 cm. - MNUAI inv. no. 4094 (Fig. 6-B): dimensions preserved height 21.4-30 cm, preserved width 10.6-14.5 cm, thickness 2.1 cm.
[36] MNUAI inv. no. 4095 (Fig. 7): dimensions preserved height 11.5 cm, preserved width 26.4 cm, thickness 2.7-3.5 cm.
[37] Refer also to the Appendix, below.
[38] CSERNI 1892, 15; SCHÄFER 2014, 279.
[39] CSERNI 1892, 15-16; the wall 'e' is visible on the published plan, east of Room 39 (CSERNI 1892, pl. VI), but it does not appear in subsequent excavation plans.
[40] CSERNI 1891, 19, 39; CSERNI 1892, 10, 13, 15.

Fig. 7. Alba Iulia, incrustation Corinthian capital from Cserni's excavations, MNUAI inv. no 4095 (C.-G. Alexandrescu, IABVP).

through modern stratigraphic and material analyses, including of the archaeological materials presented in Cserni's reports.

The reuse of elaborately decorated marble spolia points to the prior existence of sophisticated architectural programs, which required highly skilled artisans for both fabrication and installation. Once dismantled, these decorative ensembles (in this case from the late second - the early third century AD) were likely impossible to repair or replicate locally, resulting in the salvage and reuse of surviving fragments. It remains uncertain whether the original slabs belonged to the governor's palace or were introduced from other areas of Apulum.

Excavations initiated in 1992 by V. Rusu-Bolindet at 15–17 Munteniei Street (Fig. 2/ no. 4), initially conducted as a rescue intervention, revealed areas of modern disturbance but also preserved archaeological features. In Room C (Fig. 4), a section of *tegulae* pavement and a stone sewer were found *in situ*[41]. Room D' reportedly preserved marble wall revetments[42], and fragments recovered from Rooms C, W1, and W2 (particularly the southern portion of the sector) appear to derive from fallen wall revetments[43].

Approximately 30 marble fragments from this sector were documented by the present author. These display a high degree of fragmentation and, in many cases, signs of surface weathering or deeper structural damage caused by soil conditions. Preliminary identifications include revetment slabs, cornices, plinths, sculptural and furniture elements, a very small inscribed fragment, a mortarium, a molded base, and pavement slabs[44].

[41] RUSU-BOLINDEȚ 2019, fig. 15.
[42] RUSU-BOLINDEȚ 2019, 109.
[43] This sector remains under investigation; additional information beyond the finds bag labels will be included in the final publication.
[44] The finds, along with identifications proposed by the present author, will be published by V. Rusu-Bolindeț in a forthcoming book.

For the first time, a detailed examination of tool marks, tracing lines, and technological features was conducted. The majority of the fragments are carved from Bucova marble (see below), contributing new information on the quarry's production range, which extended to architectural and furniture components. Slab thickness varies from 1 to 3.5 cm, consistent with both wall and floor revetments. Several fragments exhibit saw marks. The reverse sides vary between smoothed and rough finishes, indicating considerations related to installation. Plain slabs likely clad lower walls or basins, whereas the decorated slabs, such as those recovered by Cserni (Figs. 6 and 7) and presented for the first time above, would have adorned upper walls.

The only *in situ* mosaic pavement identified within the palace was discovered in this sector, in Room h' (Fig. 4), corresponding to the second masonry phase (1992 excavations)[45]. During a subsequent (third) phase, this pavement was replaced with a marble slab floor (Room H)[46]. Overall, marble flooring remains rare in the complex, and the rationale behind its use - whether functional (*e.g.*, for baths or fountains) or decorative (*e.g.* in reception areas or shrines) - is not fully understood. As such, the finds from 15–17 Munteniei Street represent an exceptional instance.

Two additional mosaic fragments in black-and-white were retrieved from a debris layer in Room I (Fig. 4)[47]. Currently held in museum storage, these likely derive from a meandering-patterned pavement (Fig. 8). The *tesserae*, of white marble and black stone[48], were embedded in a fine lime mortar layer overlying two coarser mortar beds containing sand, pebbles, and ceramic inclusions (the *nucleus* and the *rudus*). Given the dislocated state of the mosaic, its full infrastructure remains unknown. Future stratigraphic and material analyses, including comparisons with *opus signinum* variants elsewhere within the assumed palace's area, are needed to clarify construction techniques.

Mosaics remain relatively rare in Roman Dacia[49], with only pavements attested. While some polychrome examples have been documented, many were lost following excavation. Bichrome mosaics are better preserved and especially well represented at Ulpia Traiana Sarmizegetusa and Apulum. Some stratigraphic information and data on *tesserae* are available, but comprehensive material studies are still lacking.

Our investigation directly tackles this overlooked area. In particular, the identification of Dokimeion marble in white *tesserae* from the 15–17 Munteniei Street sector introduces

[45] RUSU-BOLINDEȚ 2019, fig. 12.
[46] RUSU-BOLINDEȚ 2019, 110, fig. 12. – The slabs were not further documented. In Room H, above the earlier Room h', marble wall revetments are mentioned but were not among the examined fragments, if collected at all. The final publication should also address the stratigraphy of the *in situ* mosaic floor in this sector.
[47] RUSU-BOLINDEȚ 2019, 108; MNUAI inv. no. R8799 (Fig. 8-A): dimensions of the fragment 15.5 x 15 cm, 13.5 cm thick, *tesserae* of 1-1.1 x 1 cm and 0.9 x 2 cm, all embedded for about 1 to 1.5 cm in the fine lime stratum. - MNUAI inv. no. R8798 (Fig. 8-B): dimensions of the fragment 12.3 x 16 cm, 8-9 cm thick, white *tesserae* 0.9 x 1 cm and 0.9 x 1.5 cm, black *tesserae* 1.2 x 1 cm, all embedded for about 1.5 cm in the fine lime stratum.
[48] Refer to the Appendix and Table 1, below: sample DS63 (white marble) and DS64 (black stone).
[49] ALICU 1977; BĂRBULESCU 2025, 351-357.

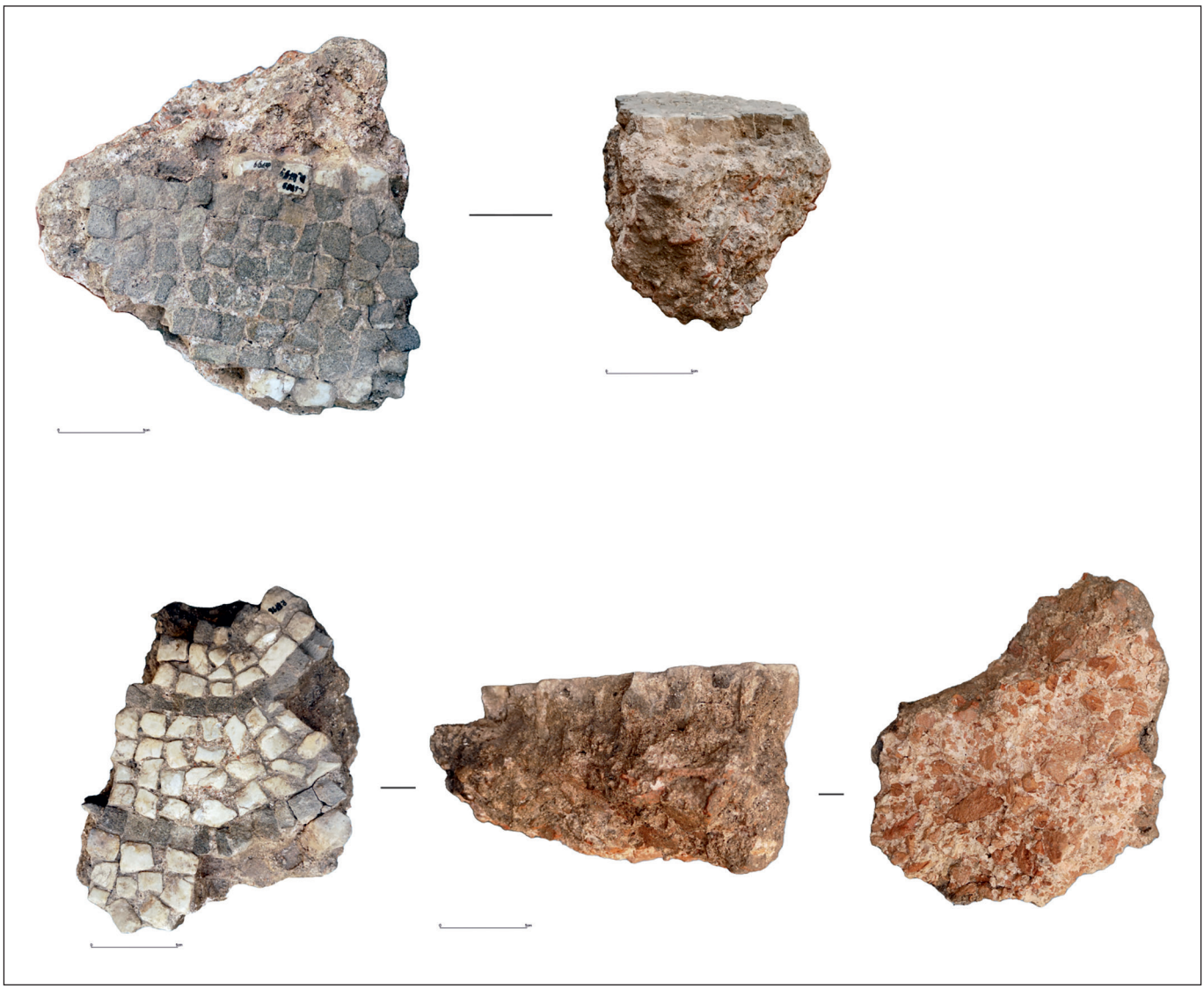

Fig. 8. Alba Iulia, mosaic fragments from the 15–17 Munteniei Street excavations: A - MNUAI inv. no R8799; B – MNUAI inv. no 8797 (C.-G. Alexandrescu, IABVP).

new considerations regarding provenance. Broader sampling is required to establish material origins. The possibility that mosaic pavements were delivered as pre-assembled kits or bundled material shipments from specialized workshops must also be considered. Such imports would imply the presence of trained installers on-site. Alternatively, the mosaics may have been entirely produced and assembled locally. A comparative study of extant pavements at Ulpia Traiana Sarmizegetusa, Apulum, and Tomis would greatly enhance our understanding of mosaic production, installation, and distribution in Roman Dacia.

TERRACOTTA TILES PAVEMENTS

In addition to common brick or standard tile flooring[50], Cserni documented pavements crafted from customized terracotta tiles of varied shapes, sizes, and colors[51]. These included dogbone, hexagonal, octagonal, rhombic, L-shaped, cross-shaped, and rectangular formats. His publications include a couple of sketches of these pavements *in situ* (Fig. 9)[52]. These more economical and practical pavements, uncovered in the area of the *praetorium consularis*, are examples of what modern scholars refer to as *opus figlinum*[53]. The terracotta tiles pavements were designed to imitate the appearance of colored marble flooring, a technique traditionally referred to as opus sectile. In some Roman provinces, this type of flooring appears to have replaced true opus sectile[54]. These pavements frequently surfaced in humid or transitional spaces: hallways, courtyards, baths, and storage rooms[55]. To mitigate wear on these brittle materials,

[50] For the list of the rooms featuring this pavement, see SCHÄFER 2014, 287, note 205. – See also Room C in the sector in Munteniei street: RUSU-BOLINDEȚ 2019, fig. 15.

[51] Only pieces displayed in the MNUAI permanent exhibition display were examined. Notably, the exhibition display cross-shaped elements from the Bumbești-Jiu *castra*, made of low-quality material. Among tiles uncovered by Cserni, most shapes have at least three size variants, except for the cross-shaped ones. For dogbone-shaped tiles, Cserni identified eight size variants plus painted versions in white, green, and yellow (CSERNI 1892, 15).

[52] CSERNI 1895, pl. IV, and CSERNI 1901, fig. 4.

[53] TANG 2005, 90-91, 181-182 (with the overview discussion on the relevant bibliography). – However, for Dacia cf. BĂRBULESCU 2025, 381.

[54] BRODRIBB 1987, 53.

[55] ADAM 1999, 230-232.

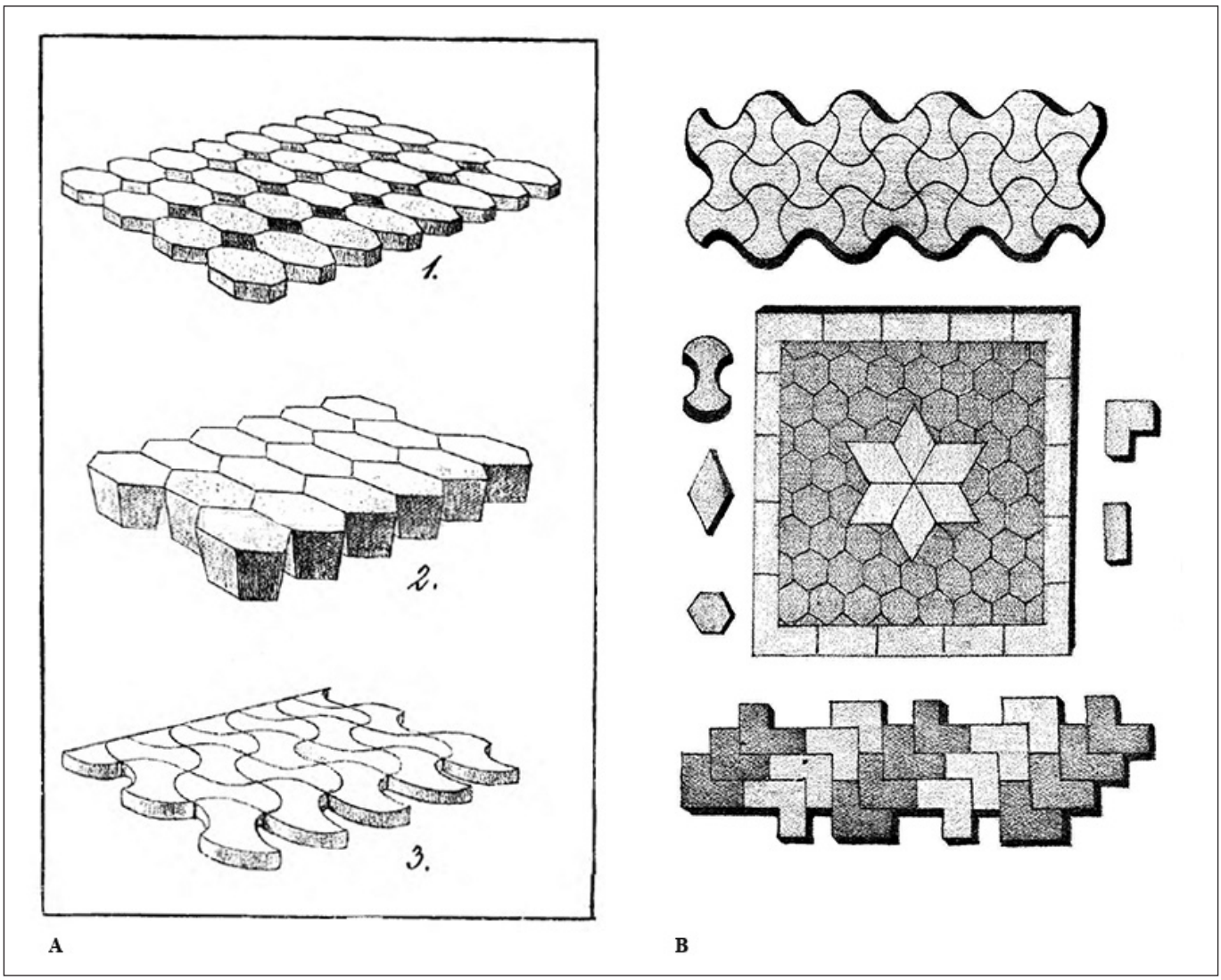

Fig. 9. Alba Iulia, terracotta tile pavements documented by A. Cserni (A – after CSERNI 1895, pl. IV; B – after CSERNI 1901, fig. 4).

small rectangular bricks were typically laid in a herringbone pattern, ensuring a tight fit (pavement variant not yet attested at Apulum). The same technique was employed for dogbone-shaped tiles, which are more frequently attested. This type of flooring required careful finishing, including smoothing and polishing, as recommended by Vitruvius (VII, 1, 4).

Unlike mosaics, composed of small *tesserae* laid over complex bedding, opus sectile used larger, shaped tiles. The pavements in Apulum represent a terracotta-based variant, with intricate geometric patterns formed by tile shape and color contrasts (*e.g.* pinkish-red and grey L- or rhomboid-shaped tiles). The term "mosaic" is often misapplied in Romanian documentation, leading to interpretive inaccuracies due to the absence of illustrative evidence[56].

Cserni's sketches illustrate pavement types comparable to *opus Alexandrinum*, a style known for colored marble inlays. Room 3 offers a particularly elaborate example[57], with reddish octagonal tiles alternating with black squares (Fig. 9-A/1), paralleling a layout in the Large Baths of Aquincum[58]. Additional photos show dogbone and hexagonal tiles *in situ*[59]. Further, Cserni notes pavements in the octagonal Room 3 (Module B) and Room 16 (with hypocaustum) in Module C, where green and yellow dogbone-shaped tiles were used[60]. These tiles were likely painted and treated to create a glazed surface, aiming to enhance their resemblance to marble opus sectile[61]. Another variant, observed in Rooms 11 and 12, used small white-painted hexagonal tiles. Firing variations created hues from anthracite to brick red, enhancing visual diversity[62].

Cserni provides detailed descriptions of the bedding layers and the structural stability of these pavements[63]. In Room 29, a 3.6 m² pavement of dogbone tiles was recovered with its bedding intact and moved to the museum[64]. Such

[56] See also BĂRBULESCU 2025, 351.
[57] SCHÄFER 2014, 278, 287.
[58] KUZSINSZKY 1890, 105-106, fig. 10; KUZSINSZKY 1892, fig. 23.
[59] SCHÄFER 2014, fig. 288 (possibly from Module D).
[60] SCHÄFER 2014, 279-280.
[61] This information remains unverified. The substantial materials stored at the Alba Iulia museum require a dedicated long-term project, which could also address ceramic building material production.
[62] The brief, preliminary examination in spring 2025 did not permit color determination using Munsell Charts.
[63] CSERNI 1892, 15, 29.
[64] CSERNI 1892, 29.

finds indicate local ceramic workshops' ability to produce customized designs, tailored for repairs and expansions, reflecting a keen awareness of practical needs and resource management, as evidenced by the strategic use of local materials.

Comparative evidence across Italy (from the Republican era and Augustan period[65]), Sicily, the Danubian provinces[66], and Britain[67] shows consistency in patterns and tile shapes. Similar pavements are known at Ulpia Traiana Sarmizegetusa[68] and Potaissa[69], thus, often linked to sites with ceramic production[70]. In Apulum, a bicolored L-tile pavement was noted at the Domus I–*thermae* site[71], though unpublished. Despite consistent formats, tile size variations likely reflect local production practices or standardized molds used for covering specific areas[72]. Consistency within each production batch was critical to ensuring a durable and well-fitted floor[73].

Together with black-and-white mosaics[74], terracotta tile pavements served both functional and decorative purposes in the buildings of the provincial elite in Dacia. Though inspired by Italic models from the first and second centuries AD, these pavements were adapted to suit local resources. Documentation gaps hinder understanding of how in Roman Dacia they integrated with mosaics[75] or marble slabs within specific rooms[76] or phases.

MARBLE OBJECTS – FURNITURE, STATUES AND STATUETTES

Marble statuary from the palace, largely in Bucova marble, lacks firm contextual data. One exception, a Venus (?) statue[77], was traced to Cserni's 1898 excavations south of Module A. However, due to poor preservation, its function and spatial relationship to northern modules remain unclear. Notably, in the same findingspot sculptural finds were found alongside dogbone pavement fragments[78].

In Room 21 (Module C), Cserni reported the discovery of several marble cornice fragments, pieces of flooring, and the right leg of a larger-than-life marble statue[79]. This space, fully excavated and interpreted as a central heating room for a baths complex, equipped with fireplaces and a water tank[80], yielded materials seemingly inconsistent with this proposed function. These findings illustrate the interpretive challenges based on architectural remnants alone. Similarly, marble revetment fragments reused in Rooms 15 and 18 emphasize later repurposing.

A fully preserved marble bench leg[81], from Room C at 15–17 Munteniei Street (Fig. 2/ no. 4) was reused in modern construction. Carved in Bucova marble, it depicts a lion's leg with a detailed paw on the front and a smoothed surface, while the sides were only roughly flattened and the top left unfinished, presumably to secure the stability of the bench seat it originally supported. While not an exceptional find within the province, this element provides rare insight into interior furnishing within the palace.

The torso of a medium-sized statuette of Diana (preserved height: 21.5 cm) was recovered from Trench XVIII/2007[82], in the southern part of the same sector, an area significantly damaged by modern construction. It is heavily weathered but made of fine-grained white marble, likely imported, possibly from Asia Minor, as several other examples from Apulum[83]. It parallels a version of the so-called Artemis-Versailles type from Malta and Tomis, an iconographic form that developed during the Hellenistic period, suggesting it arrived via trade networks distinct from those used for structural materials. Such items may have served votive or decorative roles but do not necessarily denote the presence of temples[84].

MARBLE PROVENANCE ANALYSES – RESULTS AND PERSPECTIVES

This preliminary study marks the first systematic effort to assess decorative marbles in the Apulum palace, using about 30 finds from excavations since 1992 and three pieces from Cserni's excavations. Previous research on Roman stone monuments from Apulum, including those associated with the palace complex, has largely focused on epigraphic evidence[85].

[65] GEORGE 1997, 24: hexagonal bricks were the most popular.
[66] BRODRIBB 1987, 53 – The continued use of such paving in Late Roman and Medieval buildings across modern Greece, Hungary, and Italy, along with the revival of opus sectile flooring, highlights the enduring practicality and function of this ancient tradition.
[67] BRODRIBB 1987, 50-54 – Locally sourced stone was used for opus sectile flooring in the Empire's northwestern provinces. However, systematic studies of decorative flooring types and materials across provinces or well-documented Roman sites remain in early stages.
[68] ALICU 1980, 458-460 – A pavement of, dogbone-shaped tiles *in situ*: PISO *et alii* 2006, 114, with fig. II/65.
[69] BĂRBULESCU 2025, 378-379, with fig. 301-302.
[70] BRANGA 1980; OTA 2012, 80-82.
[71] ȚIMONEA 2023.
[72] See, for example, observations from the extensive excavations at Brigetio: DOBOSI/BORHY 2015.
[73] Differences in dimensions between batches of items, such as dogbone-shaped tiles, may reflect variations in production. When documented *in situ*, these details enable reconstruction of the likely workflow of their manufacturing and installation processes.
[74] ALICU 1977; ALICU 1980, 457-458.
[75] See, for example, Tang 2005, 90 (*opus figlinum* pavement was framed by a black and white mosaic), 169.
[76] CSERNI 1892, 15, 19: pavements in Rooms 16 and 29, in Module C; SCHÄFER 2014, 283: *opus figlinum in situ* made with dogbone shaped tiles in Rooms 212 and 240, in Module F.
[77] ALMĂJANU/OTA 2016, 20-21.
[78] CSERNI 1899, 53.
[79] CSERNI 1891, 39.
[80] SCHÄFER 2014, 449 and fig. 281.
[81] MNIT inv. no V0792, dimensions height 30.5-31 cm, width 13-16.3 cm, depth 39 cm.
[82] RUSU-BOLINDEȚ 2019, 114 - The fragment is also held in the MNIT collection, though it lacked an inventory number as of our January 2021 documentation.
[83] The head of an Apollo statuette, likely found near Cserni's excavation area (OTA 2012, 98–99, pl. XXX), was excluded from marble provenance studies in Dacia. However, statuary groups of Liber Pater (MÜLLER *et alii* 2012, 55–56, AP30–31) and another fragmentary 'divine' head (MÜLLER *et alii* 2012, 53, AP25) were analyzed, revealing marble sources from Afyon and either Prokonnesus (Marmara) or Uşak.
[84] Besides numerous chance finds in Alba Iulia, several sculptures were discovered *in situ*, notably at the Liber Pater sanctuary in Apulum, where the referenced statuary groups were found. One statuette predates the temple's construction and may have been imported for interior decoration before later dedication (SCHÄFER/DIACONESCU 1997, 213). However, it might also have originally belonged to a domestic shrine.
[85] See, for example, IDR III 5; for a list of publications on the epigraphic materials, see RUSU-BOLINDEȚ 2019, 116-117, note 106.

While modest in scale, our results highlight both the potential of this line of inquiry and the urgent need for a more systematic and stratified sampling strategy in future studies.

Bucova quarries (Bucova village, Băuțar commune, Caraș-Severin county), active since the province's early years[86], supplied much of the marble in Ulpia Traiana Sarmizegetusa and Apulum, two of the main military and urban centers. Previous isotopic studies confirmed Bucova marble use, but lack of published complementary data limit broader comparative utility[87], particularly regarding pieces carved in imported marble sorts. Furthermore, those provenance analyses were primarily limited to inscribed and sculptural pieces, overlooking architectural uses, i.e. undecorated slabs.

Present findings confirm Bucova's capacity for sculpture, large architecture, and slab production suitable for interior decoration[88], revealing a broader product range. This raises new questions regarding quarry production, tool specialization, infrastructure, and the logistical planning behind construction projects. However, without systematic analysis across Dacian sites, the organization of Bucova's marble industry remains unclear. Additionally, the marble used for revetments and flooring frequently mentioned in the archaeological literature[89] has rarely been described in terms of material properties, and its provenance (whether local or imported) has not been consistently addressed. In many cases, the material was not sampled during excavation or is inadequately illustrated in publications, making retrospective identification or analysis almost impossible.

A second key result, despite logistical constraints, is the identification of imported white Dokimeion marble in the mosaic *tesserae* and possibly marble from the Asenovgrad region near Plovdiv (in the Roman province of Thracia)[90]. Whether these supplies for mosaic pavements were imported intentionally for high-status commissions or represent repurposed debris from other buildings remains uncertain. Nonetheless, their presence calls into question the prevailing assumption that imported decorative marbles were virtually absent from interior decorative schemes in Roman Dacia. Previously, the only securely documented example of imported revetment marble in Dacia was in the Capitolium at Ulpia Traiana Sarmizegetusa, noted for its reddish color[91]. However, this perceived rarity may reflect the current limitations of research and documentation rather than the actual historical distribution and use of imported marble in the province.

These results from Apulum underscore the critical need for targeted provenance studies that treat architectural ornamentation, including wall revetments and flooring, not as secondary features but as integral components of Roman material culture and economic practice in Dacia. Comparative research with Ulpia Traiana Sarmizegetusa and other sites, underpinned by systematic sampling and interdisciplinary collaboration, will be essential to reconstructing the supply networks, aesthetic preferences, and social ambitions of the Roman provincial elite and administrative centers.

CONCLUDING REMARKS

The study of spatial functionality and interior decoration in Roman Dacia, particularly within the emerging field of the "economy of decoration"[92], remains largely unexplored. While this preliminary investigation of the Governor's palace at Apulum offers no alternative interpretations to existing proposals, it does highlight key directions for future research.

A comprehensive analysis of the palace at Apulum must integrate structural typologies, decorative schemes, materials, and technologies. Features like the extensive use of heated spaces must be examined in conjunction with flooring systems, while singular cases, such as the octagonal Room 3[93], with its heated floor, highlight the need for a holistic approach that considers the interplay of wall painting, stucco, marble revetments, and flooring. Due to uneven preservation across Cserni's sector and later excavations, such interpretations must be approached with methodological caution.

The local variants of *opus figlinum*, though widespread in Dacia, stand out at the palace at Apulum as high-quality decorative elements and merit focused study. The stamped evidence points to a mixed supply system for ceramic building materials involving both military and private production. Terracotta pavement tiles, in particular, require investigation into their manufacturing process and potential origins in northern Italic traditions transmitted via Dacia's main trade routes.

Proper documentation of stucco and wall painting fragments depends on short-term access to specialized infrastructure for conservation and restoration. Multidisciplinary methods are essential to reconstruct materials, techniques, and decorative sequences.

Similarly, the presented preliminary marble analyses underscore the value of multivariate provenance studies.

[86] MÜLLER *et alii* 2012, 113-114 (with previous literature) - Teglas's pioneering study (1886) localized the quarry and highlighted the range of Roman-era marble products known in the authors' time, with most examples from Ulpia Traiana Sarmizegetusa.

[87] MÜLLER *et alii* 2012, 38, table 8, SA3-4, SA21, AP1-2 – Refer also to DIACONESCU/BOTA 2009, 19-20, 128-129, 166 and to the Appendix, below.

[88] It should be noted that information on this appears already in Teglas (1886, 130–131) and, indirectly, in Cserni's report (1892, 9–10), which accurately describes marble from the Bistra Valley (= Bucova marble) used at Apulum.

[89] The most prominent examples are in Ulpia Traiana Sarmizegetusa, from the *forum vetus* and the *domus procuratoris*.

[90] This result poses challenges and needs validation with more samples from Dacian sites. Additionally, studies in provinces adjacent to Roman Thracia, like Dacia and Moesiae, are crucial to assess regional trade and clarify the possible export of Asenovgrad marble to these regions.

[91] PISO *et alii* 2012, 122 – The information appears in various reports, short articles, and one exhibition catalogue—always without illustrations—and with some uncertainty regarding whether the slabs served as pavement or wall revetment in the Capitolium's interior.

[92] FLOHR 2019 (with discussion).

[93] The most complex example within the presumed palace area remains the octagonal Room 3. Notable, too, are Rooms 1, 4, 5, 11, and 12 in Module B and Room 29 in Module C (Cserni's sector), featuring polychrome wall painting, stucco, and customized terracotta tile pavements. In the 1962 sector, a dogbone-tile pavement was found in a room with preserved blue wall painting: OTA *et alii* 2020, 159.

Such resource-intensive research should prioritize entire architectural complexes rather than isolated monuments. To date, marble use in revetments and floor slabs appears limited, localized, and chronologically uncertain. Marble likely marked particular investment phases or external patronage, aligning with broader imperial patterns. While lavish interior decoration was often linked to private or collegial benefactors, its relevance to the Apulum palace remains unclear.

Reassessing decorative elements across the palace is essential to decode construction phases, room functions, and spatial hierarchies. While decoration alone cannot define use, it remains crucial for understanding architectural intent. The palace's customized program, though short of luxury[94], reflect deliberate choices balancing ambition and economic constraints amid third-century instability.

The local economy of interior decoration in Dacia's urban centers, such as Apulum and Ulpia Traiana Sarmizegetusa, is poorly understood. Evidence suggests that specialized artisans, particularly for marble revetments and mosaics, were likely brought in from outside the region[95]. The palace's evolving construction history likely favored adaptable and economically efficient solutions that still provided a dignified interior for work and residence. The province's mid-third-century political and economic instability likely further constrained decorative ambitions.

Distinguishing early, more elaborate phases of decoration from later, austere ones will require further excavation and stratigraphic analysis.

The question of what constituted luxury decoration in Apulum's public and private architecture remains unresolved, highlighting the need for extensive interdisciplinary research. Comparative studies are indispensable for situating these local expressions within the broader provincial and imperial frameworks, allowing for a more nuanced understanding of their cultural and social significance. Recent rescue excavations at Apulum's *canabae/municipium Septimium* (Domus I-*thermae* and Domus II[96]) promise key insights once published, helping clarify regional decoration markets and, ultimately, the decorative strategies of the Governor's palace complex.

[94] SCHÄFER 2014, 286; RUSU-BOLINDEȚ 2019, 112.
[95] For discussion on the economic aspects of local and regional/provincial market of decoration, see FLOHR 2019, 121-122.
[96] A. TIMOFAN, https://turism.apulum.ro/destinations/ruta-obiectivelor-romane-din-alba-iulia-the-route-of-the-roman-sights-from-alba-iulia/ [accessed 01.06.2025]; ȚIMONEA 2023.

APPENDIX ON MARBLE PROVENANCE ANALYSES

Walter PROCHASKA and Vasiliki ANEVLAVI

If possible and safe for the preservation of the finds, several marble fragments examined in this project were sampled to determine their provenance using a multivariate analytical approach[97]. For 16 samples (Table 1), the provided marble chips were suitable for analysis.

The macroscopic inspection revealed two distinct groups: one consisting of medium- to coarse-grained white to grey marbles, and another, represented by just two samples (DS62 and DS63, Table 1), consisting of fine-grained white marbles.

The archaeological samples were compared to a database of over 5,500 geological samples from marble quarries and outcrops across the ancient world, including sites such as Aphrodisias, Carrara, Prokonnesos, Dokimeion, Pentelikon, Paros, Thasos, Miletos/Heraklea, Ephesos, as well as sources from Roman Macedonia and Thrace. Additionally, locations in their surrounding areas were included. The following diagrams illustrate the final selection of quarries that show the closest chemical similarities to the examined archaeological samples.

The results from the isotopic diagrams of the first group were inconclusive, as most of the quarries overlapped (Fig. 10-A). As the next step, a multivariate diagram was created using the variables Mg, Fe, Mn, Sr, δ18O ‰, and δ13C ‰ (Fig. 10-B). This analysis indicated that all the samples originated from the local source of Bucova marble. Prokonnesos marble was excluded from the final diagram due to its distinct chemical characteristics, particularly the high concentration of Mn in the archaeological objects.

In 2012, H. Müller and his team published a study on a large number of marble artifacts from Apulum, all made of Bucova marble[98]. Their analytical data from the Bucova quarries closely align with the Bucova samples in our dataset, which were used for the evaluation in this paper. The 2012 publication also included trace element analyses for the quarry samples (whole rock analysis via X-ray fluorescence, as reported by Müller *et alii* 2012). Despite the different analytical methods used in this study (Bucova samples were analyzed using AAS), the carbonate solution analysis (AAS and ICP-MS) allows for comparison of calcite-bound elements such as Mn, Fe, Sr, and Mg. Unfortunately, for the artifacts, only isotopic data were published in 2012, and no trace element analyses were provided.

Table 1. The analytical results with the data on sample and artefact identification, the stable isotopic values of Carbon and Oxygen, and the chemical values from the ICP-MS (ed. V. Anevlavi, W. Prochaska, OeAI/OeAW).

Sample	Artefact	δ18O (PDB)	δ13c (PDB)	MgCO3%	Mn	Fe	Sr	Cr	V	Y	Cd	B	La	Ce	Pr	Dy	Ho	Yb	Pb	U
DS37	plinth	-2.63	1.58	1.00	67.18	323.27	122.82	2.93	0.88	2.14	0.26	5.28	1.02	0.50	0.13	0.15	0.04	0.09	0.91	0.15
DS38	molded base	-2.42	1.96	2.55	34.47	155.29	124.91	1.84	0.34	1.51	0.24	3.27	0.51	0.15	0.05	0.08	0.02	0.06	0.69	0.04
DS39	slab	-2.28	2.11	2.48	59.04	120.85	116.47	1.48	0.45	3.33	0.35	2.70	1.16	0.45	0.16	0.24	0.06	0.15	0.41	0.07
DS41	slab	-2.31	1.87	1.68	32.55	113.61	122.25	1.98	0.34	1.74	0.31	4.08	0.72	0.32	0.08	0.12	0.03	0.08	0.84	0.07
DS42	slab	-1.63	2.04	2.69	31.94	100.85	125.86	1.77	0.37	1.97	0.32	4.69	0.83	0.32	0.10	0.14	0.03	0.09	0.46	0.03
DS43	slab	-2.57	1.93	1.86	20.96	80.51	122.01	1.87	0.22	1.70	0.30	2.67	0.80	0.27	0.10	0.11	0.03	0.08	0.63	0.04
DS46	slab	-2.58	1.93	2.08	21.38	73.49	135.59	1.60	0.31	1.88	0.29	3.00	0.80	0.26	0.10	0.13	0.03	0.08	0.35	0.04
DS47	slab	-3.07	1.96	5.81	55.75	117.22	111.37	1.58	0.67	4.38	0.35	4.35	1.70	0.71	0.28	0.36	0.08	0.20	0.79	0.02
DS48	slab	-3.12	1.82	2.66	31.96	96.30	125.90	1.76	0.36	1.94	0.31	4.67	0.82	0.31	0.10	0.13	0.03	0.09	0.48	0.04
DS56	slab	-2.79	1.88	2.63	29.41	144.99	129.05	1.66	0.55	2.96	0.24	2.90	1.36	0.58	0.18	0.21	0.05	0.13	0.56	0.24
DS58	slab	-2.42	1.90	1.22	18.15	28.50	107.56	1.54	0.17	1.74	0.28	2.49	0.63	0.21	0.07	0.10	0.03	0.08	0.22	0.02
DS59	MNUAI 4096	-2.33	1.97	2.73	57.01	78.22	112.36	1.63	0.32	1.65	0.30	2.20	0.77	0.33	0.09	0.11	0.03	0.07	1.00	0.05
DS60	MNUAI 4095	-1.62	1.96	2.41	39.96	66.85	127.28	1.54	0.34	2.88	0.30	2.00	1.11	0.40	0.14	0.19	0.05	0.13	6.87	0.09
DS62	slab	-6.02	2.03	1.17	19.89	379.47	158.37	1.45	0.19	4.79	0.21	2.74	3.04	2.29	0.51	0.46	0.10	0.21	2.97	0.13
DS63	tessera	-6.08	1.91	0.80	36.04	161.57	132.95	1.49	0.15	0.50	0.06	0.97	0.42	0.49	0.07	0.05	0.01	0.03	0.68	0.03
DS64	tessera	-10.63	-7.61	2.14	3044.93	12214.08	407.38	55.01	16.36	11.34	0.12	94.04	13.31	30.44	3.82	2.37	0.43	0.85	6.17	0.79

[97] Sampling and description were conducted by C.-G. Alexandrescu, analyses by W. Prochaska and V. Anevlavi (Austrian Archaeological Institute, Austrian Academy of Sciences, Vienna), with the financial support from the project PN-III-P4-ID-PCE-2020-1031 from the Romanian Executive Unit for Financing Higher Education, Research, Development, and Innovation (UEFISCDI).

[98] MÜLLER *et alii* 2012.

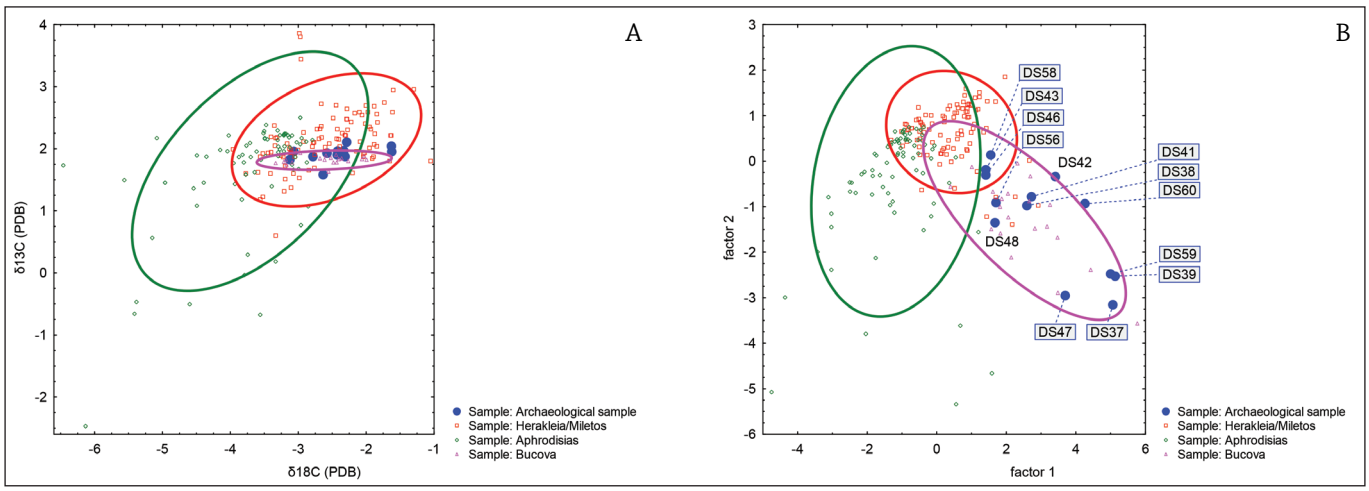

Fig. 10. Marble provenance analyses: diagram A - The isotopic diagram of the Apulum medium-grained samples, and diagram B - The multivariate diagram of the Apulum medium-grained samples. The variables used are Mg, Fe, Mn, Sr, δ18O ‰, and δ13C ‰ (V. Anevlavi, W. Prochaska, OeAI/OeAW).

The two fine-grained samples yielded inconclusive isotopic results (Fig. 11-A). Their isotopic and chemical data do not align with the local geological source, clearly indicating imported origins. A wide range of fine-grained quarries was tested, and the results revealed that sample DS63 originated from the Dokimeion marble quarry, while sample DS62 came from the Asenovgrad marble source, a Thracian quarry located in inland Bulgaria[99]. The multivariate diagram was created using the following variables: Mg, Fe, Mn, Sr, Cd, V, Y, La, Ce, Yb, U, δ18O ‰, and δ13C ‰ (Fig. 11-A). The numerical statistics confirmed the provenance of these sources with a high relative probability of 94-94%.

The sample DS64 (black *tessera*) is grey to black in colour. It is possible that the sample is a silicate-rich carbonate (similar to carbonaceous quartzite) or a volcanic rock (see Table 1). Petrographic analysis revealed that the sample consists of two distinct sections: the white section is a crystalline marble with a heteroblastic texture. It contains calcite grains, with a maximum size of 0.5 mm, set in a very fine-grained calcitic groundmass. Additionally, clusters of dark aggregates, similar in composition to the black section described below, are included. The black section is a mafic to ultramafic rock composed of pyroxene and plagioclase. This mineral assemblage shows a strong retrograde overprint. As a consequence the pyroxenes have been extensively retrogressed to chlorite, while the plagioclase has transformed into sericite. Pseudomorphs of sericite after garnet are also visible. A few grains of quartz are present as well. This assemblage appears to represent the original boundary of a sedimentary layer, marking the interface between a carbonate rock and the eroded and weathered debris of ultramafic rocks. The likely provenance of the stone has yet to be determined.

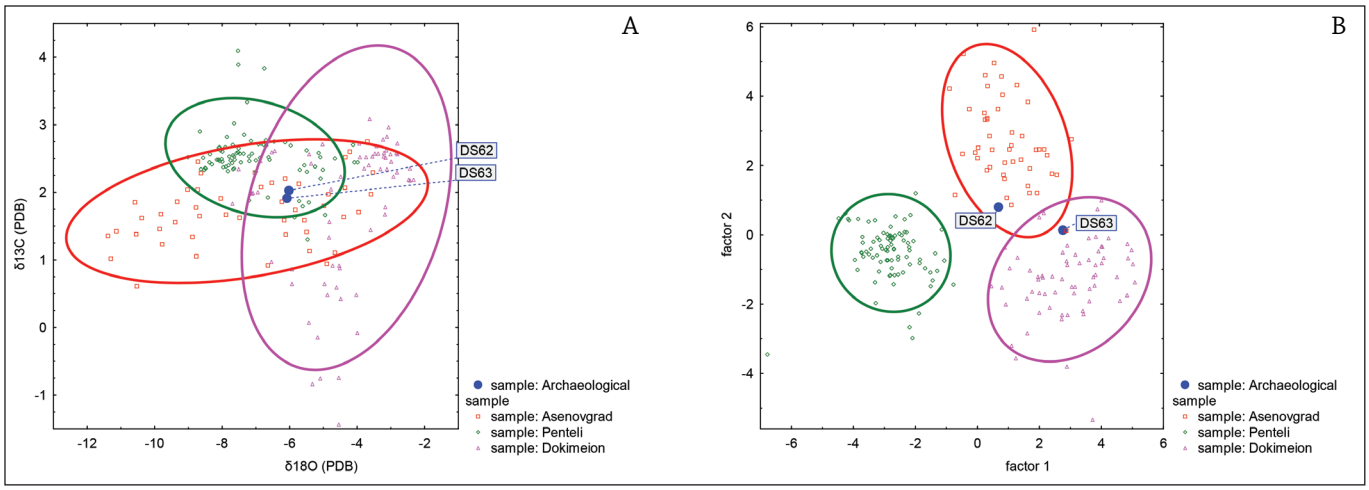

Fig. 11. Marble provenance analyses: diagram A - The isotopic diagram of the Apulum fine-grained samples, and diagram B - The multivariate diagram of the Apulum fine-grained samples. The variables used are Mg, Fe, Mn, Sr, Cd, V, Y, La, Ce, Yb, U, δ18O ‰, and δ13C ‰ (V. Anevlavi, W. Prochaska, OeAI/OeAW).

[99] The mentioned quarries in Thracia were under the study of the FWF project no: P 33,042 at the Austrian Academy of Sciences (Project leaders: S. Ladstätter, W. Prochaska).

ABBREVIATIONS

AAS
: Atomic Absorption Spectroscopy

ICP-MS
: Inductively Coupled Plasma Mass Spectrometry

IDR III 5
: I. PISO, Inscriptions d'Apulum (Inscriptions de la Dacie Romaine III 5). 2 vols. (Paris: Diffusion de Boccard) 2001.

IABVP
: "Vasile Pârvan" Institute of Archaeology, Bucharest

MNUAI
: National Museum of the Union, Alba Iulia

MNIT
: National Museum of the History of Transylvania, Cluj-Napoca

OeAI/OeAW
: Austrian Archaeological Institute/Austrian Academy of Sciences

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