

## GEOMETRIC MOSAIC PATTERNS DESIGN AT MADABA. A COMPARATIVE STUDY

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### Abstract

*The site of Madaba in middle Jordan has many churches from the Byzantine period. In the church of the Virgin Mary, dated to between the end of the Sixth and the beginning of the Seventh Centuries A.D, we uncovered one of the most impressive and best-preserved mosaic pavements with geometric patterns in the Near East. In this paper, the writers attempt to show that the Madaba mosaicists were true masters of their profession. They combined motifs that enjoyed a long popularity from the early and through the middle Roman period, with new designs appearing here for the first time, as far as is known. An attempt is made to trace the history and survival of several geometric patterns from the mosaic in the church of the Virgin Mary by comparison with the same patterns found elsewhere in the Levant. The significance of the non-figurative character of this mosaic and those of other church floors in West bank, Syria and Lebanon of a similar date is also considered.*

**Keywords:** Mosaics; Decoration; Pavements; Madaba; Church of the Virgin Mary and Byzantine.

### Introduction

The Church of the Virgin Mary is one of the most important sites with geometric mosaic pavements in Madaba, with one of the best-preserved baptistries in the area. It is considered one of the first discovered churches to be dated to the Byzantine era. In 2009 Pope Benedictus XVI visited the Madaba area; it is considered one of the five Christian pilgrimage sites in Jordan. Amongst the beautiful runs discovered, mosaics were the most decorative ornaments found in both religious and civil buildings dating from 5th century until the 8th century. Madaba is well known for its magnificent mosaic floors such as the Madaba Mosaic Map dates back to the 6th century and the mosaic of the church of the Virgin Mary, the subject of this article. The purpose of this study is to examine the specific types of geometric designs in comparison with other pavements of the Hellenistic, Roman, and Byzantine periods. Madaba city is situated approximately 30km southwest of the Jordanian capital, Amman, about 775-800 meters above sea level.

The church of the Virgin Mary is located in the center of the city of Madaba, along the roman road that crosses the city from east to west (Cardo) and is one of the most important structures with geometric mosaic pavements in Madaba. The mosaic of the church of the Virgin Mary was the first mosaic floor in Madaba, known to scholars even before 1890 (Fig. 1). The

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aim of this study is to describe the geometric designs and to compare them with other pavements with a Roman and Byzantine period, where influences in design within and between region can be discerned.



**Fig. 1.** The Church of the Virgin Mary

The history of Madaba represents a unique and genuine urban and religious heritage that can still be observed in the remaining monuments [1]. Archaeological excavations and historical evidence, however, indicate that the city of Madaba was flourished during the Roman, Byzantine and Islamic periods. The Department of Antiquities of Jordan (DOA) acquired the site of the virgin church in 1972, and a short investigation work was performed. Systematic Excavations were carried out in this important site from 1979 to 1985, by the Franciscan Archaeological Institute with the cooperation of the (DOA) under the directorship of Michele Piccirillo. The church is now enclosed by an archaeological park with several byzantine churches. The church of the Virgin Mary was built above a public hall of the town of Madaba which had been decorated with a beautiful mosaic floor with the myth of Phaedra and Hippolytus and was built in the first half of the Sixth century over a roman temple [2-4]. Both, the roman temple, and the Hippolytus Hall are on the south side of a paved courtyard.

The church of the Virgin Mary is the only church in Madaba that follows a centralized plan (Fig. 2), it consists of an internal vestibule, around nave (9.70m in diameter) and an elongated apse presbyterium (7.10x5.80m) which is supported by two underground rooms with barrel- vaults. There is a courtyard built over a deep cistern on the west side of the church. The façade of the church opens into a narthex. There are three doors in the west wall and one door in the north wall. Also, the chancel screen divides the nave from the apse presbyterium.

The around nave rare in the region; it seems we find one example from Church of Saint John at Gerasa, which dates to 531 AD [5]. There is one example is in the West Bank, the Round Church at Beth Shean, which dates to the last quarter of the 5th or beginning of the 6th century AD [6]. The round design is known from Albania during the Byzantine period, for example the Butrant Baptistry, which dates from the 6th to 7th centuries AD [7-10]. Significantly, this design is a good deal older, as it was already in use during the Greece period and was a common design throughout the Roman period. We find it, for example, the Plan of Monopteros at Knidos, which dates from the late 3rd early 2nd century BC and the Hadrian's Villa at Tivoli, dating from the second century AD [11].

#### *Dating of the Church of the Virgin Mary*

There are two Greek inscriptions on the floor of the church, they do not give us clear evidence of the history of the church's construction.

***The first inscription***

The inscription (Fig. 3) consists of eight-line placed within tabula ansata in front of the chancel screen tells us that the church was rebuilt and beatified by the “care and zeal of the Christ loving people of Madaba [12].



**Fig. 2.** Plan – The Church of the Virgin Mary



**Fig. 3.** The Greek inscription. The Church of the Virgin Mary

***The Second inscription***

The Greek inscription located in the center is round medallions which occupied by a Greek inscription and enclosed in guilloche (Fig. 4). The inscription composed of black tesserae on a white background. The Greek inscription reminds the faithful who enter the church of the spiritual purity necessary for proper veneration of the icon of the Virgin Mother [13].

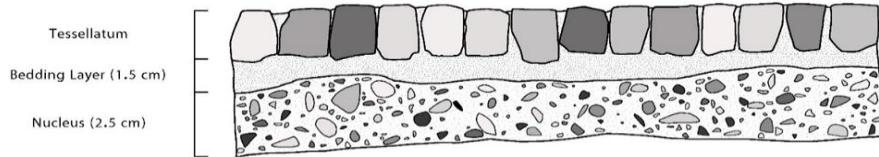


**Fig. 4.** Greek inscription. The Church of the Virgin Mary

However, the history of the church was through the system of architecture and mosaic technology. The aforementioned mosaic had been laid, a first time at the time of the construction of the church in the end of Sixth Century AD and redone in the Abbasid period (767 AD) [14, 15]. The importance of this mosaic derives from its late date (after the fall of the Umayyad dynasty), this indicates that there was still a sizable Christian community in Madaba sufficiently prosperous to rebuild the church and decorate it with a new colored mosaic floor [16].

### **Mosaic Pavement Construction Technique**

According to the detailed visual in situ examination and the analytical study of the mosaic layers and the polychrome stone tesserae, the layers forming the mosaic are arranged from bottom to top as follows: the first is a thick layer of large stones, known as the `statumenn, used to create a leveled surface and to stabilize the ground to avoid settlement and deformation. The second layer, called `nucleus` made of fine mortar, consisting of aggregates (marble dust, sand) mixed with ash, of 2.5cm thick. The tesserae were fixed over this layer using a `bedding layer`, layer, made of a mortar very rich in lime, of 1.5cm thickness. The tesserae used averaged around 1.0-1.5cm (Fig. 5). The colors of the tesserae are white, black, yellow, orange, gray, pink, red and brown. All the rock types constituting the tesserae can be classified as limestone [17-19].



**Fig. 5.** Illustrative drawing of mosaic layers

### **The mosaics studies description and comparative study**

The mosaic floor that is the subject of this article comprises a geometric carpet, one of the most distinctive in the religious buildings of Byzantine Jordan. This article addresses the designs in comparison with other work of Roman and Byzantine date. The nave floor mosaics of the Church of the Virgin Mary are distinguished by a wonderful carpet design that contains a composition mixture of different decorative elements. It is surrounded by motifs of diamonds as well as Solomon's knot and looped circle with square motif. We have classified the carpet and other decoration motives of the floors of the nave and the chancel into five main types: Dogs-tooth pattern; composition border (half-circles and squares with looped); composite pattern (two-stranded guilloche; circles interlocked with bands; two interlocked squares with bands; large circle with bands); five looped motifs and squares and diamonds motif.

#### *Dogs- tooth pattern*

The outer border extending around all four sides of the main carpet consists of a dogs-tooth pattern (Fig. 6). The colors of the pattern are black, red, yellow, and gray against a white background.



**Fig. 6.** Border- Dogs- tooth pattern. The Church of the Virgin Mary

#### *Composition border pattern*

The decoration of the composition of middle border (fig. 7) is composed of two different interlocked motifs. It is a large consists of looped half-circles forming concave rectangles, while the looped squares are interlocked with half-circles and located central half circles and concave

rectangles. The colors of this pattern are red, black, yellow, brown, and gray against a white background.

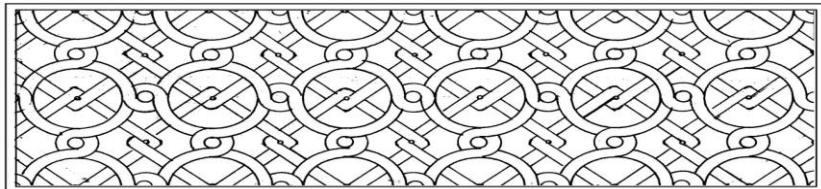
The composition pattern is rare in the region and elsewhere; nonetheless we find some examples, it seems similar to this design, for example, the southern aisle of the Church of Saint Mary at Rihab (Fig. 8) dating to 582-583 AD [20]. Here, the design filled with orthogonal pattern of squares in bichrome bands interlooped angles, while we find the pattern of circles in asymmetrically shaded bands interlooped tangentially forming concave octagons. The colors are dark red and light red against a white background.

This type of ornamentation was also found with the same design and colors in the southern aisle of the Church of Saint Peter also at Rihab (Fig. 9), dated to 623 AD [21-23]. A similar decoration can be found in the northern intercolumniation of the Procopius Church at Gerasa which dates to 526 AD [24-26].

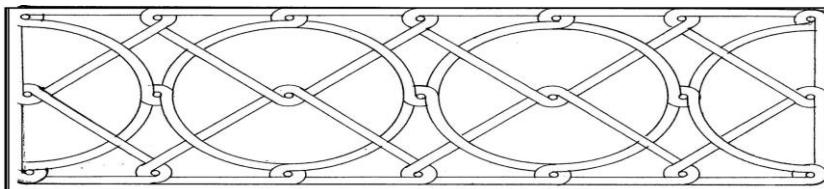
Further, one example in the floor of the Church on the Acropolis at Ebus (Hesban) (Fig. 10), dating to the Byzantine period [27, 28]. Here, the design without Looped Square with knot.



**Fig. 7.** Composition border pattern. The Church of the Virgin Mary



**Fig. 8.** The Church of Saint Mary, Rihab



**Fig. 9.** The Church of Saint Mary, Rihab



**Fig. 10.** Looped half-circles. Acropolis Churrrch - Ebus (Hesban)

### *Saw tooth border motif*

The inner border extending around all four sides consists of a serrated saw-tooth pattern (Fig. 11). The colors of this pattern are red, white, yellow, black, and gray against a white background. Many parallels are found in Byzantine churches in Jordan [29, 30].



**Fig. 11.** Saw tooth border motif. The Church of the Virgin Mary

### *Two-stranded guilloche motif border*

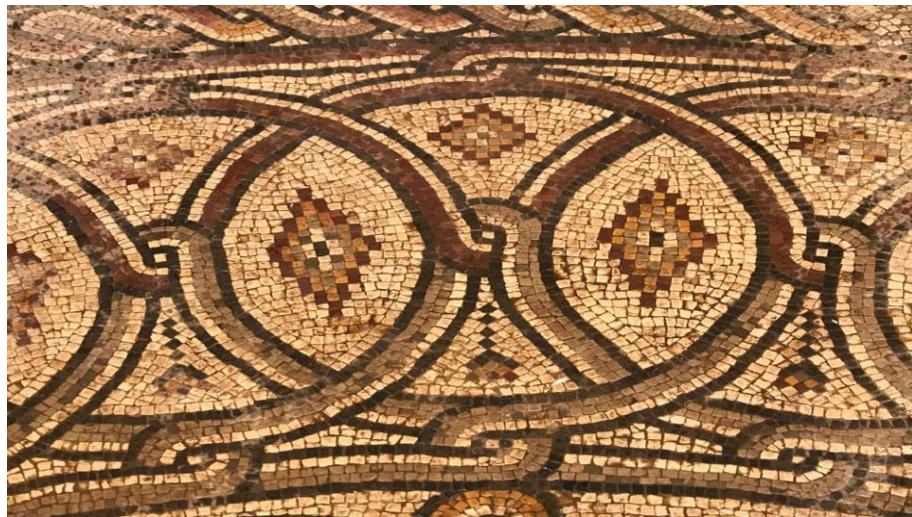
The motif consists of two-stranded guilloche (Fig. 12) is located between saw tooth and interlaced border motif surrounded the composite circle. The colors of this pattern are red, white, yellow, black, and gray against a white background. Many parallels are found in Byzantine churches in Jordan [31-33]. This particular border pattern is widespread in mosaics dating from the Roman and Byzantine periods.



**Fig. 12.** Two-stranded guilloche border motif. The Church of the Virgin Mary

### *Interlaced border motif*

The large border surrounded the great composite circle with interlaced two squares (Fig. 13). It consists of interlaced horizontal ellipses interlocked tangentially, in asymmetrically shaded bands. The colors are red and black, yellow, white and gray against a white background. The pattern is rare in the region and elsewhere.



**Fig. 13.** Interlaced border motif. The Church of the Virgin Mary

Similar motifs can be found at other locations: at Khirbat Hubeila in the West Bank the border of the central nave of the church [34]. Examples are also found in Greece: on Kos in the central nave of the Major Basilica at Kephalos, dating to fifth-sixth century AD [35], in Basilica C in Thebes in Phthiotis (Nea-Anchialos), dating to sixth century AD [36, 37], and at Butrint in

Albania (Buthrotum) in the Baptistry, which dates to 525–550 AD [38, 39]. Here, the interlaced circles without bands.

#### *Composite motif pavements*

The motif consists of two overlapping squares that make up an eight-shaped star (Fig. 14). It is connected with two internal and external circles through knots. The outer circle is connected to interlace border, while the inner circle is surrounded by two-stranded guilloche decoration. There are some plants and geometric decorative elements such as Simple Solomon's knot motif located inner between the circle and interlaced squares. The colors are red, black, yellow, and gray against a white background. The pattern is rare in the region and elsewhere. This pattern is also known in mosaics in other churches in Jordan in the Byzantine periods; for example, on the floor of the nave of the Church at Shunah al-Janubiyah (Fig. 15), dating to the Byzantine period [40, 41]. Here, however, the pattern is composed of interlaced squares and ellipses with inner circle decorated with diamonds, flowers, and loop motifs. The colors are dark red, yellowish, black, and light red against a white background. Moreover, we find the motif design also in the floor of the nave of the Church of Saint Paul at Rihab, which dates to 595 AD [42, 43]. Here, the two overlapping squares are contact with inner circle with four knots. The colors are dark red, yellowish, black, and light red against a white background.



Fig. 14. Composite motif, Virgin Mary Church

Fig. 15. Composite motif, Shunah Al-Janubiyah Church

Significantly, the motif is considerably older, already in use during the Roman period and a common design throughout the Roman period. For example, in the floor of the Eastern Bath od Villa Palazzi di Casignana at Calabria in Italy, which dates between the 3rd and 4th AD. Here, the overlapping squares came as eight-star design with two-stranded guilloche and polychrome motif. Another example also from Italy was found in the floor of the Villa Piazza Armerina, which is dated to mid-fourth century AD [44]. This has also been found on floors of the Misis – Mopsuestia, Cilicia in Turkey, dating to the Roman period [45].

Moreover, we find overlapping squares that make up octagon – shaped appeared in some locations in the reign and elsewhere. For example, in the center of the nave of the North chapel – Church at Zay Al-Gharby near city of Salt, which dates to the Byzantine period [46]. Here, the two overlapping squares are contact with outer circle with eight knots, while the center of the motif came a rosette with eight petals. The colors are dark red, yellowish, black and light red against a white background. Similar design also appeared in some locations in the west bank, for example, in the floor of the middle room of the Church at Tell es-Samak (Shiqmona), which dates to the Byzantine period [47, 48]. Here, there are the floor of the room field with ten overlapping squares that make up octagonal design some of them are decorated by rosettes and crosses.

#### *Looped pattern mosaic*

The looped pattern is decoration of the floor of the church (Figs. 2, 16-18), four motifs appeared in the large square border two motifs are similar; in addition, we find another motif in

the front of the main church entrance. The looped pattern here consists of a different design classified to three types, looped with many circles (Target); Looped with Maltese Cross design and looped with Solomon Knot. The colors are red, black, yellow, white and gray against a white background. It seems the patterns design of motives is rare in the area and elsewhere.

#### *Looped with Target*

The looped with target motifs are in the north and southwest of the corners of the main square of the nave (Figs. 2 and 16). The design consists of many circles and each corner of the inner square a roseate motif. The colors are red, black, yellow, white, and gray against a white background. It seems the patterns design of motives is rare in the area and elsewhere. We find one example similar those found at the Church of the Virgin Mary was found on the floor of the nave of the North Church at Hesban, which dates to the Byzantine period [49]. Here, the square inner of a big circle with saw tooth motif. The colors are red, black, yellow, white and gray against a white background. One example can be found in the third panel of the northern chamber of the Second Church at Yasileh, which dates from 528 AD [50], here, the motif consists of looped circles connecting with a non-equilateral octagon and the center a target design. The colors are red, dark red, and white, on a red background.

#### *Looped with Maltese Cross design*

The motifs are in the north and southwest of the corners of the main square of the nave (Fig. 17). The design consists of four outlined spindles and looped with Solomon Knot, while the center is composite of a Maltese Cross. The colors are red, black, yellow, white, and gray against a white background. It seems the patterns design of motives is rare in the area and elsewhere. Nevertheless, we find the Maltese Cross design similar to those found at the Church of the Virgin Mary can be found in the Southern intercolumniations of the Church of Khirbet al-Bediyyeh, which dates from 640 AD [51]. Here, Crosses are formed in the spaces between each grouping of four petals and two circles.

Significantly, the Maltese Cross design is a good deal older, as it was already in use during the Hellenistic period and was a common design throughout the Roman period. We find it, for example, on the floor of Sanctuary – Montmaurin or La Villa [52, 53]. Finally, there are however more examples from the Roman Empire, for example in the floor of the Bath C, Room 47 at Antioch, which dates from 350-400 AD [54]. Here, the motif consists of a square with outlined quatrefoil over four petals came as Maltese Cross design resample those found at the Church of the Virgin Mary. Another is at Philippopolis in the Domus Eirene, dating to the Early Christianity [55].



**Fig. 16.** Looped with Target



**Fig. 17.** Looped with Maltese Cross design

#### *Looped with Solomon Knot*

The looped with Solomon knot motifs are located in front in the main entrance of the Church (Fig. 18). The motif composed of a looped circle within a square and the Solomon Knot located in the center. It seems the Solomon Knot here common as crosslet. The colors are red,

black, yellow, white and gray against a white background. It seems the patterns design of motives is rare in the area and elsewhere.



**Fig. 18.** Looped with Solomon Knot

The looped pattern in general is widespread during the Byzantine period, there are many parallels in the region, for example, is on the floor of the North Church at Ebsus (Hesban), dating to the Byzantine period [56], here the inner of the circle came as a rosette motif, it is colors are dark red and light red against a white background.

The pattern is also known from the northern part of the Levant on the floor of the House of Ge and the Seasons in Antioch-Daphne, dating from the late 5th century AD [57], though here, the rosettes are shown in the center of the looped circles in two small squares. The colours of the pattern are dark red, light red and dark blue against a white background. Also, this type of decoration appeared before in the city of Antioch, for example, the floor of the Bath of Apolausis, dating from the Roman period [58], [59], though here, there are two birds are shown in the center of the looped circles in square. The colors of the motif are white veined with blue, black, shades of red, and yellow.

#### *Squares and Diamonds Patterns*

The entrance of the church from the west is decorated with squares and diamonds (Figs. 2 and 19). The colors are red, black, yellow, white and gray against a white background.



**Fig. 19.** Squares and Diamonds Pattern/ The Church of the Virgin Mary

The areas in the right and left of the main carpet are also decorated with the same design. The squares and diamonds patterns are widespread during the Byzantine period in the region and elsewhere, there are many parallels similar to those in the Church of the Virgin Mary. For examples, one of these is on the floor of the north and south aisles of the Church of Bishop Leontios at Ya ‘amun, which dates to end of the 5th or the beginning of the 6th century AD [60].

## Conclusions

This paper has attempted to show that Madaba city an important point of reference with respect to the study of the mosaic pavements of the Byzantine period. In general, the Madabaian artists showed high ability and technical skill in producing these decorative elements, it seems using only locally available stone (limestone, basalt, jasper and oil shale) as a raw material.

The Madaba City is important from several perspectives, first as a major pilgrimage site in Jordan. The round nave is unusual in the area—we find one other example in the West Bank, the Round Church at Beth Shean. We see also the high level of skill attested by the mosaic pavements in this church. Comparative study of the decorative elements increases our understanding of the relationship between the Church of the Virgin Mary and other Byzantine sites. It seems the Madaba area is a center of the workshop of the mosaic's decoration as a school.

Similar elements have been found in other sites in the Levant, and of particular interest are the similarities between decorative elements found at Madaba and several sites, as well as in the broader territory of the Roman and Byzantine Domains. What is significant about the elements found at Madaba is that they demonstrate that Madaba benefited from the talents of one of the superior Byzantine mosaic schools in the Levant, specializing in geometrical designs.

Also, we find some designs make their first appearance in the mosaics of the Virgin Mary Church at Madaba — comprises a geometric carpet design (Fig. 2); a Dogs- tooth pattern (Fig. 6); Composition border pattern (Fig. 7); interlaced border motif (Fig. 13); Composite motif (Fig. 14); looped with Target (Fig. 15) and Looped with Maltese Cross design (Fig. 16). From this comparative study it is possible to say that there are many shared elements, indicating cooperative knowledge on the part of these artistic projects, widely spread during the Byzantine period. The authors hope that these findings will contribute to the study of this significant phenomenon.

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