VARIATIONS IN SIZES, SHAPES, MATERIALS AND COLOURS OF MOSAIC TESSERAE IN SOUTHEASTERN ANATOLIA REGION

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

YAPRAK TANRIVERDİ

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
BUILDING SCIENCE IN ARCHITECTURE

FEBRUARY 2016

Approval of the thesis:

VARIATIONS IN SIZES, SHAPES, MATERIALS AND COLOURS OF MOSAIC TESSERAE IN SOUTHEASTERN ANATOLIA REGION

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ABSTRACT

VARIATIONS IN SIZES, SHAPES, MATERIALS AND COLOURS OF MOSAIC TESSERAE IN SOUTHEASTERN ANATOLIA REGION

Tanrıverdi, Yaprak

Ph.D. in Building Science, Department of Architecture

Supervisor: Prof. Dr. Soofia Tahira Elias Ozkan

February 2016, 270 pages

The aim of this research was to quantify ancient mosaics by their shape, size, material and colours. The study made an attempt to classify the various shapes and sizes of the tesserae used in ancient mosaics, which would help identifying and documenting the subject domain. Investigating tesserae colors was both for drawing attention to types of material used in ancient mosaics and first step for proposing a color catalog of Anatolia, one of the most important mosaic centers of world.

Commagene Region in Southeast Anatolia was selected for case study as it hosts Zeugma-Belkıs mosaics is close to Antioch mosaics, and the region is accoutered with archeometrical artifacts. Information on Commagene Region mosaics from Arsameia, Samosata, Perrhe, Bahasna and Zeugma settlements, in literature was gathered in order to propose an identification catalog for each mosaic. Following this, mosaics from Adıyaman and Zeugma Mosaic Museums were investigated in detail, they were photographed and distinguished colors were detected with Konika Minolta Chroma meter. Tesserae sizes were measured from taken photographs and shapes were drawn in computer with Coreldraw. According to data obtained tesserae shapes were classified into seven groups, namely; square, rectangle, trapezoid, parallelogram, triangle, amorphous and definitive piece which was roundel shapes used for specific delineations such as eyeballs. A small color chip

was prepared for each measured tesserae and presented in catalog of related mosaics. Mosaics from Arsameia and Bahasna were not attainable in the Adıyaman museum therefore tesserae traits and color measurements was conducted on Samosata, Perrhe and Zeugma mosaics.

According to results meander was the common motif used in all settlements. Commagene Region mosaics mostly contained tesserae from yellow (Y) and yellow-red (YR) pages of Munsell Soil Color chart. Green and blue pages had few chips which explain the reason for use of smalti in the region. Mastery was indicated with tesserae size and tesserae density in Samosata and with color use and tesserae density in Zeugma and Perrhe. In addition six samples such as pinkish white and grey colored carbonatic rocks and unique colored ones such as blue, red and green from Perrhe was minerologically analyzed with X-ray diffraction (XRD), which revealed carbonatic rocks were calcite and blue, red and green tesserae were glassy structures.

Keywords: Commagene Region, ancient mosaics, tesserae size, tesserae shape, color catalog

ÖZ

GÜNEYDOĞU ANADOLU BÖLGESİNDEKİ MOZAİK TESSERALARINDA BOYUT, ŞEKİL, MALZEME VE RENK ÇEŞİTLİLİĞİ

Tanrıverdi, Yaprak

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Şubat 2016, 270 sayfa

Bu çalışmanın amacı antik mozaikleri tesseraların şekil, büyüklük, malzeme ve renklerine gore sayısallaştırmaktır. Ayrıca bu mozaiklerde kullanılan tesseraların şekil ve büyüklüğünü sınıflandırarak birer kimlik oluşturma ve belgelemeye yardımcı olma girişiminde bulunulmuştur. Tesseraların renk analizleri ise hem kullanılan malzemelerle ilişkilerini vurgulamak hem de dünyanın en önemli mozaik merkezlerinden biri olan Anadolu'nun mozaik renk katalogunu oluşturmak için bir adım önermektedir.

Çalışma için Güneydoğu Anadolu'da ki Kommagene Bölgesi seçilmiştir. Bölge Zeugma mozaiklerini barındırmakla birlikte Antakya mozaiklerine de yakındır, ayrıca birçok arkeometrik eseri barındıran zengin bir dokuya sahiptir. Literatürdeki Kommagene Bölgesi, Arsameia, Samosata, Perrhe, Bahasna ve Zeugma yerleşimleriyle ilgili bilgiler toplanmış ve her bir mozaik için bir kimlik katalogu oluşturulmuştur. Bunu takiben, Adıyaman ve Zeugma Mozaik Müzelerindeki mozaikler detaylıca incelenmiş, fotoğraflanmış ve belirgin renkler Konika Minolta Chroma metreyle ölçülmüştür. Tessera büyüklükleri çekilen fotoğraflardan bilgisayarda ölçülmüş ve şekilleri Coreldraw programında çizilmiştir. Buna göre tesseralar kare, dikdörtgen, yamuk, paralelkenar, üçgen, amorf ve gözbebeği gibi tasvirlerde kullanılan yuvarlak belirleyici parçalar olmak üzere yedi gruba

sınıflandırılmıştır. Ölçülen tesseralar içim küçük renk çipleri hazırlanmış ve ilgili mozaiğin katalogunda sunulmuştur. Arsameia ve Bahasna mozaiklerine bu çalışma için erişilememiştir bundan dolayı tessera özellikler ve renkle ilgili çalışmalar Samosata, Perrhe ve Zeugma mozaiklerine uygulanmıştır.

Sonuçlara göre, menderes tüm Kommagene bölgelerde kullanılan bir ortak motiftir. Mozaik tesseraların rengi yoğunlukla Munsell Toprak Renk tablosunun sarı ve sarı-kırmızı sayfalarındandır. Yeşil ve mavi sayfaları az sayıda çip bulundurmuştur bu da bölgede bu renkler için cam mozaik kullanımının sebebi olabilir. Ustalık Samosata mozaiklerinde tesseraların küçüklüğü ve yoğun kullanımıyla yansıtılmışken, Zeugma ve Perrhe'de yoğunluğun yanı sıra renk çeşitliliğiyle gösterilmiştir. Bunlara ek olarak, Perrhe tesseralarından karbonlu kayalardan pembemsi beyaz, gri ve nadir görülen mavi, kırmızı ve yeşil altı adet örnek X-ışını kırınımı analizine tabi tutulmuştur. Buna göre, kayaçlar kalsit, mavi, kırmızı ve yeşil örnekler camsı malzemelerdir.

Anahtar kelimeler: Kommagene Bölgesi, antik mozaikler, tessera boyutu, tessera şekli, renk katalogu

To my family and friends

ACKNOWLEDGEMENTS

I owe my deepest gratitude to my supervisor Prof. Dr. Soofia Elias Tahira Ozkan not only for her great guidance, encouragement and endless support at any time, but also showing me what only matters is to work on something you love. It has been a pleasure and honor to work with her.

I would like to thank all jury members for their valuable comments and guidance. I should mention Prof. Dr. Ömür Bakırer and Assoc. Dr. Erhan Akça especially for their contribution both in this study and to my intellect; this thesis was not just an academic research but also a journey with them. I thank to my academician friends from Adıyaman University and METU for their friendship and contribution. Thanks to Adıyaman Museum and Zeugma Mosaic Museum's crew for their help especially to Fehmi Eraslan. I also want to thank Barış Salman, we never met, but his dedication and love to Southeast Anatolia mosaics should be acknowledged, hope he rests in peace.

Thanks to Özün for her help and good times; Aysel, Sabahattin, Gülşah and Sinem for giving me shelter and a family in Ankara. My special thanks to Sabahattin, Muzaffer, Kahraman and Osman Kılınççeker for sharing their library, instruments and ideas with me and for their support.

Thanks to all my faithful friends; Esra, Kadir and Volkan for their friendship and support whenever I need. In addition; of course thanks to my roomie Hülya for all she has done for me, her support, friendship and all the fun. Very special thanks to Osman for his encouragement, patience and endless help throughout the thesis, everything is easier together.

Finally, I would like to express my special thanks and love to my family. This study would not have been possible without their encouragement, support and faith in me.

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LIST OF ABBREVIATIONS

ABBREVIATIONS

RGB:	Red, green, blue
H:	Hue
C:	Chroma
V:	Value
R:	Red
YR:	Yellow-red
Y:	Yellow
GY:	Green-yellow
G:	Green
BG:	Blue-green
B:	Blue
PB:	Purple-blue
XRD:	X-ray diffraction analysis
ST:	Sample tesserae
θ:	Tetha
Å:	Angstrom, unit for d-spacings (the distance between atomic planes in a crystal)

CHAPTER 1

INTRODUCTION

This study concerns mosaics in terms of color, tesserae size and shapes independent of style to determine a mapping of coloring schemes and tesserae properties in order to develop a mosaic atlas of Anatolia which is known as one of the most important mosaic centers in the world. The argument, objectives of the thesis and general procedure are proposed respectively in this section. Moreover, the disposition of the report is given at the end of this chapter.

1.1 Argument

Among the most durable forms of decorative art to have survived from antiquity, mosaics are vivid, long lasting murals and pavements used as finishing materials in ancient houses, buildings, palaces etc. They improve the service and decorative qualities of buildings or structures and protect structural members from atmospheric and other effects. Along providing luxurious and smooth finishing and especially refreshing floors for hot climates; these decorative and functional surfaces also carry information related to materials and elements used in the construction of mosaics, architectural contexts they belong to, and the techniques of mosaic making through their persistency.

Artists create mosaics by setting small pieces of materials in different colors, in a mortar to create geometric or figurative designs (Güvenir, 2008). This technique was widely-used in ancient times especially in Roman Era and sometimes regarded as one of the identifying features of Roman presence in an area. Mosaics' appearance

varied enormously ranging from plain monochromatic floors through simple designs in two colors, usually black and white, to the most elaborate of polychrome geometric patterns to designs based on floral and vegetal motifs and to scenes with human and animal figures. The basic structural character of mosaics and the technical methods of laying them, however, remained constant once the use of tesserae had developed, with only minor changes throughout the centuries into the early Middle Ages (Dunbabin, 2012). An important group of mosaics from ancient world recovered unharmed are being exhibited in museums at different locations such as Antioch (Antakya, Turkey), Bardot (Tunisia), Zeugma (Gaziantep, Turkey) etc. On the contrary some got lost due to wars, natural disasters, or theft and some may not have been unearthed yet.

Mosaics permit a variety of approaches and disciplines to conduct studies through their durability. First of all they are artisan works serving a practical function, closely linked to their architectural context. On the other hand they constitute a significant art form that illuminates the evolution of pictorial, figurative and ornamental style and composition over an unbroken span of more than one thousand years (Dunbabin, 2012). Moreover, the figured scenes offer an extraordinary range of information about the visual culture of those who commissioned them, such as reflections of the social preoccupation and interest of the owners.

In literature majority of the studies on mosaics include definitions, techniques (Rossi, 1970) style, meaning or the analysis of the materials which are important for restoration and conservation of mosaics. Studies concern the cultural context of the mosaics (Acar, 2011), social reflections and daily life (Balty, 1989; Görkay, 2012), architectural context mosaics belong to (Dunbabin, 2012, Önal, 2000) or conservation and restoration status of the mosaics. This group of studies is generally qualitative where the importance of the mosaics is emphasized. Conservation and preservation status of the mosaic especially forms an important part of the qualitative studies for the fact that it may lead to loss of cultural heritage such as the Belkıs/Zeugma case in Anatolia where they were submerged under water due to the construction of a dam (Acar, 2000; Başgelen, 2000; Başgelen 2000a; Ergeç, 1995; Önal, 2000; Tanaka, 2007).

Another group of the researches focuses on the geometric compositions used in ancient mosaics to analyze the development and formation of motifs and patterns, which yielded the evolution of the culture of the site. Investigating the geometrical patterns enables to understand the development of motifs within time and to facilitate comparisons with different time periods and cultures. For instance, the comparison of the geometrical shape used in a pavement mosaic and an Islamic motif would highlight the similarities and differences between these two different cultures. Geometrical motifs are also studied elsewhere for interpreting cultural variations (Balmelle, Blanchard- Lemée, Christophe & Darmon & Guimier-Sorbets & Lavagne & Prudhomme & Stern, 1985; Demiriz, 2002; Elias-Ozkan & Ozkan 2007; Toussaint, 2013; Turnheim & Ovadiah, 1999).

Material investigation including natural stones or glass tesserae, the coloring agents and opacifiers constitute another group that has utmost importance for identifying the materials used in mosaics. However, these studies did not focus on the cultural effect on mosaic production because the focus was oriented on geological sites. The point is mainly the structure of the material itself rather than the whole content of the mosaics including the motif design or the meaning of the mosaic (Bustacchini, 1973; Shugar, 2000; Arletti, Quartieri & Vezzalini, 2006; Zanyi, Shroer, Mudge & Chalmers, 2007; Van der Werf, Mangone, Giannosa & Traini & Laviano & Coralini & Sabbatini, 2009; Croveri, Fragala & Ciliberto, 2010; Akyol, Kadıoğlu & Demirci, 2011; Gill &Rehren, 2011).

In other words, studies on mosaics are either qualitative focusing on the scenes, and style or quantitative carrying out experiments on the properties of the materials. The research field lacks quantitative studies that discuss meaning, style, and shape of the mosaics; thus, detailed quantitative studies are needed for documenting the unique sites for present and future studies of archaeology, archeometry, art history and for other disciplines.

This research was carried out as a quantitative study on the tesserae traits, colors from a specific region in order to reveal a palette of the colors used and classify tesserae shapes and sizes to display the most preferred shapes and sizes of tesserae in mosaic designs. Moreover pointing out tesserae size and shape and color similarities

and differences between different regions was another way of highlighting the regional trends and styles. It should be mentioned writer's background as an interior architect may create differences in approach to the subject which may enrich the study as an interdisciplinary research. Throughout the study South East Anatolia, Middle Euphrates region was selected due to the fact that it hosts Zeugma-Belkıs mosaics, is close to the Antioch, and the region is accoutered with archeometrical artifacts. In addition Roman mosaics found in this region, which are heavily influenced by Greek mosaics, include sea motifs, animals and scenes from Greek mythology that enabled to investigate mosaics belong to different periods. However this study is not doing assessment of style in mosaics, therefore themes and subjects are not the cases in the study. Inevitably the study makes no attempt at complete coverage of the region and some major regions such as Osrhoene Region are omitted. Osrhoene mosaics significantly differ from the samples selected for the study both in the use and style. Consequently only Commagene Region mosaics are the object of discussion.

1.2 Aim of the Study

The aim of this research was to quantify ancient mosaics by their shape, size, style, context and colours. Additionally the study aimed to classify the various shapes and sizes of the tesserae used in ancient mosaics, which would help the documentation of mosaics also. The objectives of the thesis are to:

- Investigate colors used in the mosaics in order to create a mapping of colors used in the ancient Southeast Anatolia mosaics.
- Specify the shapes and sizes of the tesserae used in ancient mosaics to determine whether there is a tesserae shape index such as the ones used for rock-pediments.
- Create a Mosaic Color Atlas and Tesserae Shape-Size Index of the Commagene Region in Southeast Anatolia which may be used as guide for archaeologists, archeometrists, art historians and researchers from other disciplines.

1.3 Procedure

The first stage of the study is composed of a literature review on definition, techniques, development of mosaic art and use of mosaics in different time periods. A brief history is provided on Commagene and Osrhoene Regions in Middle Euphrates that are famous with their rich mosaics. After that for Zeugma mosaics the ones depicting the deity Dionysus are selected because quantification of this collection is beyond the limits of this study used in the study due to region's varietal richness. For this fact brief mythological information about the deity and his life is presented along mosaics portraying him close to Anatolia. Then a catalog is provided to outline the descriptive information on mosaics both from literature and new findings like color values detected with chroma meter, Munsell Soil Color Chart and measured tesserae sizes and shapes. Tesserae in each selected mosaic piece are drawn, presented in both monochromatic image to emphasize the tesserae shapes; and colored one to reveal detected color values and chips. Tesserae were grouped according to shape classification proposed and smallest and biggest pieces sizes are given. In addition to this, some samples from Perrhe are subjected to X-ray diffraction analysis and results are evaluated in the archeometric contexts. As an outcome of the study a Color Catalogue of the Commagene Region Mosaics is presented with detected color chips. Tesserae shapes and sizes are evaluated in order to suggest a quantitative approach for the selected materials.

1.4 Disposition

This report is composed of five chapters, of which Introduction is the first and introduces the subject of study including its argument, aim and objectives with procedure of study and disposition of the report.

Second chapter includes literature review on subject domain. Literature review consists of definition of mosaic, its production techniques and mosaic examples from different periods. Studies conducted on color and tesserae traits are discussed followed by mosaic locations of Southeast Anatolia focusing on Commagene Region. Osrhoene Region mosaics are only mentioned literally to keep the integrity

of the mosaic development in Southeast Anatolia. This chapter was concluded with the life and mosaics of Dionysus close to Anatolia which was selected for Zeugma collection since its varietal richness is beyond the limits of this study.

Third chapter is dedicated to the material and method of the study. Stages of the research, drawings, color measurements, tesserae shape and size studies are given following the devices and instruments used throughout the study.

In the fourth chapter, the results of the study, together with Color Catalogue, X-Ray Diffraction analysis and interpretations about tesserae shapes and sizes are given.

In the final chapter a brief outline of the study along with the findings.

CHAPTER 2

LITERATURE REVIEW

In this Chapter, a survey of literature is presented in five sections. The first section holds an introduction to the mosaic art including definition, techniques and mosaic examples from different periods such as Classical era, Hellenistic Period, Roman Era or Byzantium Period. Studies conducted on color and tesserae traits are discussed in the second section. In the third section mosaic locations of Anatolia is given focusing on the Southeast Anatolia mosaics and to limit the study, Euphrates River is taken as a point of departure and mosaics from Commagene Region are taken as samples omitting the ones from Osrhoene Region due to the differences both in style and period. Osrhoene mosaics are only mentioned literally. Fourth section includes Dionysus as limitation factor to select mosaic samples from Zeugma collection. The reason why the deity is selected and mosaics depicting scenes from his life are presented. Moreover, a critical review of literature is given at the end of this chapter.

2.1 Mosaic Art

In this section definition of mosaic and a brief history is given. Following that, pebble mosaics and tesserae mosaics are discussed from different periods as mosaics from Hellenistic Period or Roman mosaics. Important settlements hosting mosaics are mentioned.

2.1.1 Definition of Mosaic

Mosaic is the art of making images with the application of small pieces of colored glass, stone, or other materials on a surface (Seyyfert, 1957; Tülek, 1996). The

contemporary designer of mosaics practices an art that has its origin in the dim millenniums preceding the birth of Christ. From these ancient times to the twentieth century, men have used mosaics to adorn their tombs, temples, houses, pavements, churches and cities. The designs and images produced by arranging bits and pieces of clay, stone, marble and glass have provided a vivid and lasting record of many and varied cultures. Small pieces, normally roughly cubic of stone or glass of different colors, known as "tessera" are used to create a pattern or picture (Furietti, 1752). Tessera is derived from the Greek, meaning four or little cube (Timmons, 1971). Since modern mosaic designs incorporate almost any material that can be adhered the little cube definition is scarcely adequate to cover the great variety of materials used by contemporary mosaic artists.

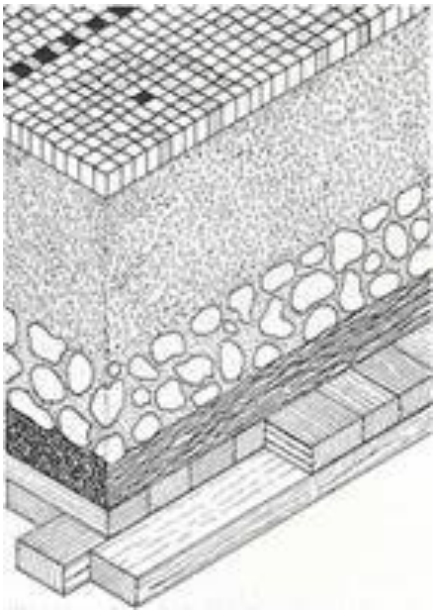


Figure 2.1 Mosaic Preparation (Mosaic Technique, 2012).

One reason there are so many fine examples of historic mosaics to study and learn from, is the durability of the materials. Pebbles, marble and glass create enduring works of art that, unlike frescoes are relatively impervious to water damage. Another reason for the abundance of historic mosaics is that most of the early mosaics were floors and pavements and when buildings collapsed floors were buried and protected

from till excavations (King, 2003). It is obvious the art of mosaics has a long history stretching back 5000 years. Despite many upswings or downturns in popularity, its appeal has endured. Mosaics simply used as a tool of telling stories of the time such as scenes from wars, coronation or from important dates. Materials used in the mosaic making are also the indicators of the stones, glasses and other local materials where they belong to which are very important sources for documentation; as those materials are only subjected to physical changes such as cutting and coloring.

Today, advancements in tools and materials have made the mosaic making process easier, quicker, and the results more varied and visually appealing, but overall the process is still the same as before. As mosaics are integral parts of the architectural buildings; it was inevitable to install them directly where they will be used. However figurative and exquisite motifs and embellishments were prepared in workshops and then applied to the place where they were planned to use (Ling, 1998). Despite the fact that there are few written records of early mosaic techniques; the most comprehensive information regarding the creation of mosaic art was written around 77 AD by Pliny the Elder who was a roman officer and encyclopedic. In his Natural History series Pliny describes the technique for the proper preparation of mosaic ground ("Mosaic Technique", 2015). Preparation of mosaic ground began with a layer called the statumen. The statumen was a layer of tightly packed pebbles and rocks between three and five inches (8 to 12 cm) thick (Encyclopedia Britannica, 2015). On top of this layer was a ten inches (25 cm) of rough mortar called rudus (Encyclopedia Britannica, 2015). The rudus was comprised of three parts gravel and fragments of terracotta and one part lime. It was to be covered with a layer of mortar called the nucleus, which was also about three to five inches thick. The mortar used in the nucleus was made of three parts sand mixed with smashed tiles and bricks and one part lime. The mortar used in the nucleus was of a finer grade than that used in the rudus. The design was put into the nucleus and the mosaic tiles were affixed to the top with a layer of mortar created from fine sand and lime. The lime was often colored so that the lime between the mosaic tiles would match the color of the mosaic surface (Fischer 1969; Ling, 1998; Vitruvius, 2005; Dunbabin, 2012).

Even though the stated above method is the ideal one for preparing mosaic designs, from archeological investigation it can be said that often the statum and rudus were

left out. Sometimes even the nucleus was abandoned and the tiles laid directly into the fine mortar on the floor. So it is most likely the ideal method for laying mosaic ground was apparently not the most common one. This can be linked to the popularity of the mosaics in those times, which is also a time consuming and expensive process, mosaic artist most probably sacrificed steps in producing the ground to speed completion and limit cost (Timmons, 1971). In middle Euphrates, mosaics were applied on floor depending on the status of the ground. In Zeugma when the room is located on rock, sometimes artist directly laid the mosaic on rock, which also prevented them from being stolen in later times (Ergeç, 1995).

In the ateliers layouts drawings of the motifs and embellishments were kept in order to modify the design depending on the floor it will be applied on. Artists transferred the design on floor with the help of rope, pin, ruler and compass (Dunbabin, 2012).

2.1.2 Mosaics

In literature there are several studies about mosaics including definitions, techniques and mosaics found in order to understand the development of mosaics. One of these important studies is Ferdinando Rossi's "Mosaics, A Survey of Their History and Techniques". In this book, definition of mosaic and its techniques are stated. According to Rossi (1970), mosaic word is obtained from the word "musa" however in Roman Era the word "musaico" is commonly used. Seyffert (1957) mentions that mosaic is a decorative art where various colored glasses, marble, colored stones, terracotta, pebbles etc. are laid on a lime including mortar. Those materials are called "abakichoi" in Greeks and "abaculi" and "tesserae" or "tesselae" in Romans. Aygüneş (2006) mentions the Greek and Latin word "lithostroton" as the figurative designs on floor mosaics. The composition in center is called "emblema".

According to Ling (1998) in ancient times mosaic was named as opus musivum or opus museum. It is also known that floor mosaics were called pavimenta tessellata. First mosaics were made using pebbles obtained from rivers or sea. Later stones were cut and named as tesserae (Vitruvius, 2005). Blake (1930) mentions that passing from pebbles to tesserae technique was occurred in 3rd Century BC in Mediterranean

though Levi (1947) claims it was happened in Morgantina- Sicily. Mosaic history dates long back. Although there is no agreement on it, on a temple in Uruk Mesopotamia between 4000-3000 BC tiny baked clay cones were first used as a strong finishing material for mud-brick structures. The head of these cones were colored in black, white or red, and by inserting them into the mud plaster on the walls a pattern was achieved (Ling, 1998; Ozkan & Ozkan, 2007; Dunbabin, 2012). For most this was not exactly a mosaic but is the first step to mosaic, which has been discovered to date (Rossi, 1970).

Figure 2.2 Uruk cone mosaic columns (derived from https://www.studyblue.com/notes/note/n/art-history-335-test-1/deck/12172265, 2015)

During the excavations in 1919, some columns from Nikhursag temple were found. Those columns were adorned with squares and herringbone motif made of red limestone and pearls. Stones were laid in a layer of tar, which was applied on wood. Hieroglyphs and figures were carved and filled with colorful pebbles. In Egypt mosaic was used on walls and columns of the temples, in burial chambers, on sarcophagus, or on small objects as ornament. Ivory boxes also were adorned with colorful stones and glasses. Materials used were china pieces, obsidian, quartz, alabaster, yellow limestone, cornelian, feldspar, enamel, lapis lazuli, green serpentine and black granite. Figures were used as a part of decoration also had religious features (Perrot, Chipiez, 1884).

In the ancient art of Near East civilizations mosaics are not seen. In Greece and Anatolia they are seen just after the Greek classical era, finally in 2nd Century BC Roman mosaics were spread out from east to west in all Imperial provinces. After the Roman Empire had collapsed, mosaic art had its development in Iran and Byzantium lands. With Renaissance mosaic lost its popularity and replaced by the painting (Tabanlı, 2007).

The historical development of mosaics depends on two different methods: pebble mosaics as a reflection of Classical Period and tesserae mosaic where Hellenistic Period is characterized (Güvenir, 2008). Chronologically;

I. Classical Period Mosaics- Pebble mosaics
II. Hellenism Mosaics- Tesserae Mosaics

2.1.2.1 Classical Period Mosaics- Pebble Mosaics

Pebble mosaics are basic examples consist only a few colors. In the first years mosaics were used for paving and formed with primitive methods in flooring for functional usage without aesthetic concerns. Early floor mosaics were made with cut stones and gravel and are seen in Anatolia and Greece (Şen, 2009). The best mosaic remains are from Gordion, Phrygia in between 8th- 7th Centuries BC. Those samples were non-figurative mosaics with geometric motifs including rosettes, triangles and key motif (Haswell, 1973; Bingöl, 1997). However apart from Gordion mosaics differs in manner from other examples; Classical era mosaics are similar to Roman mosaics in style and can be considered as pioneers of Roman style (Özügül, 1996).

There was a gap till 5th Century BC after then, motif usage incrementally ascended and mosaic panels became more decorative and imposing. Compositions were then including human and animal figures. The pebble mosaics in Olynthus include rectangular and circular motifs. However in those pioneer mosaics, the ones with medallion-middle composition in mosaics- are not very successful. Mosaics were used in the rooms called Andron where male guests were hosted or in courtyards.

Figure 2.3 Olynthus Pebble Mosaic (Tabanlı, 2007)

Figural compositions were from mythological subjects such as Bellerophon, Nereid, the marriage of Poseidon and Amphitrite, Kentauramakhie, Griffons. Figures were depicted on dark background in lighter tones and mainly black and white though some parts of the pavements include dark red, green and pink pebbles. Olynthus mosaics date back to 5th Century BC where stones were smaller than six cm embedded in a seven cm mortar (Şen, 2009).

From the Olynthus pavement examples the most important one is Bellerophon mosaic situated in Avi III House. This mosaic is historically important to be the first example illustrating a mythological subject, made of pebble and covers an area of 3x3 meters. Central panel, where a Lycian hero Bellerophon kills monster Chimera on his horse Pegasus; is surrounded by geometric motifs. Corinth, Skioni, Diphylo and Piraeus near Athens, Eleusis, Sparta, Tarsus and Sicilian-Motyka are other centers where examples from Classical era are found (Şahin, 2004).

When the mosaics from Pella, which date back to IV Century, are investigated there is a significant progress in both style and technique. Floor panels include more and bigger figural contexts. There is a concern about color selection; black and white tesserae were combined with black marble and quartz. Bricks were grained and added to the mortar in order to obtain a reddish yellow background. Green and dark red pebbles are used in details (Dunbabin, 2012).

Figure 2.4 Bellerophon Mosaic (Wikipedia, 2015)

Human is in clothes and has shadow; the use of lead contours around figures gave depth to the figures. New motifs such as vine frieze were introduced (Petsas, 1963). The mosaic where Dionysus is illustrated on top of a puma is considered as the examples that reach highest point at both technique and style (Güvenir, 2008).

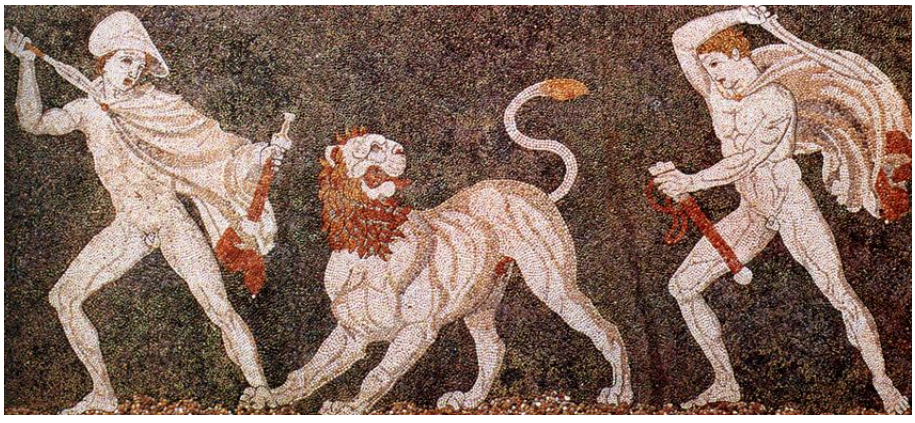


Figure 2.5 Pebble Mosaic, Lion Hunting, Pella (Wikipedia, 2015)

Figure 2.6 Pebble Mosaic, Dionysus, Pella (Wikipedia, 2015)

2.1.2.2 Hellenism Mosaics- Tesserae Mosaics

In 3rd Century BC a new method for mosaic making was found, which is cutting the stones as the artists pleased. This technique was first used in Morgantina (Sicily) (Levi, 1947; Philips, 1960). In this technique stones were cut in cubic, rectangular and triangular prisms and prepared before application and then installed to the mosaic panel. It is thought that, the need of cutting stones may be related to the aim of creating mosaics similar to paintings. Most popular mosaics had been done using stone and glass tesserae. Glass was the second important material used in mosaic panels following natural stone. In this period marble, bricks, ceramic tesserae, terracotta pieces and lastly gold and silver were used. Gold and silver were used in Roman Era. In Hellenistic mosaics, two techniques were employed. Central compositions were created with Opus Vermiculatum[1] and background and infill were created with Opus Tessellatum[2] (King, 2003).

[1] Opus Vermiculatum: The tesserae are inserted in a worm-like winding pattern, which is often used for outlining or emphasizing a shape for pictorial effects.

[2] Opus Tessellatum: The tesserae were laid as a grid and rows in the grid are offset to resemble the common brick bond.

Figure 2.7 Medusa Head-Pergamon (Panoramio- Longpassages July 2005, 2015)

Figure 2.8 Delos pavement (Panoramio- Longpassages July 2005, 2015)

In 2nd and 1st Centuries BC mosaic art became widespread. Most important mosaic centers in Hellenistic era were Pergamon (West Anatolia) and Delos (Greece). Use of tesserae updated the repertoire though motifs remained similar (Dunbabin, 2012). There was generally a central composition and a border around. In Anatolia, Erythrae, Assos and Pergamon gave examples of this period.

Figure 2.9 Issus War mosaic, Italy (Wikipedia, 2015)

The most important mosaic in Italy from Hellenistic period is the Issus War mosaic, which is also known as Alexander Mosaic (Zevi, 1998; Şen, 2009). As the result of Hellenistic Period feature, figures are three-dimensional and mosaic is colorful.

Towards the end of 1st Century BC usage of emblema begins to decline. Compositions were made of both basic materials and geometries. Black and white tesserae were preferred to use. The most important factor in the emergence of this style was being easy and cheap (Şen, 2009).

Roman Art and Mosaics

With the end of the Hellenistic Era centers of the art shifted from Western Anatolia and Greece to Rome. The roots of the Roman art should be sought in Etruscan and Hellenistic art (Abbasoğlu, 2006). The influence of all states is evident in all branches of Roman art. Anatolia is one of these important states, had been the cradle of great civilizations since ancient times and carried their effects through the ages. In Roman Era, Anatolia with the help of cultural heritage and deep-rooted history adapted the period easily and maintained its art (Sadberk Hanım Müzesi, 2006).

Roman art often does not show a specific style of development. Romans did not refrain adopting the valuable art concepts of antiquity in painting, sculpture or architecture. In addition to styles they adopted different religious beliefs as well. Therefore in parallel to these beliefs; buildings, houses, sculptures, paintings and mosaics showed different characters. However, towards the spread of Christianity, antiquity in Roman art lost its importance along naturalist view as narrative technique and symbolism took its place (Tabanlı, 2007).

Romans had a distinguished place in history as planners and organizers. Roman art had spread in frontiers as planned and in this regard Roman architecture reflected Roman culture with all details. Therefore, fundamentals of Roman art lie in architecture. Architects were Roman and exposed Roman art and sight typically to the buildings. In Roman architecture Etruscan rustic elements can be found. Classical and Baroque style structures can be seen also in time period. Houses give the most comprehensive idea about Roman architecture (Turani, 2007). Roman houses

included a peristyle -columned courtyard in a building that may contain an internal garden- (Önal, 2013). Rooms surrounding the peristyle had doors or windows to take fresh air and light. Luxurious ones such as Zeugma houses were around 700m^2 and had 15-25 rooms. Water was the key element of the houses. Due to the hot climate shallow pools called impliviums were constructed in peristyles as architectural elements to collect rainwater. Sometimes fountains were used in pools to give an aesthetic value to the house. In shallow pools mosaic floors were used. Themes of mosaics in pools were generally related to sea, river, sea animals and gods (Görkay, 2012). Palaces and villas also reflect the glory and wealth of the Roman civilization.

It is generally accepted that Roman painting was a continuation of Hellenistic art and were seen on walls of Roman houses. Those paintings partially used in the house and reflected the subjects related to domestic life can be considered as Roman-Hellenistic painting compositions. These subjects and description techniques were both same in houses and sacred places. Especially figures were from Greek mythology (Wheeler, 2004). Mosaic art, as an extension of painting; had its heyday in Roman era. Roman mosaicists combined traditional roman style with local colors and patterns with a great mastery, and provided quality of Roman mosaics.

In this period, opus tessellatum was employed and even in all states tesserae sizes got bigger and leaded to the lower density or in other words less tesserae per centimeter square of mosaics. Using smaller tesserae for the figures and larger ones for the background peculiar to the Hellenistic mosaic floors have also disappeared in this period. Emblema and medallions slowly put off, central panels were enlarged in order to create bigger spaces for figurative scenes (Hinks, 1933).

Since the beginning of the Roman Imperial Age, the developments occurred in the cheap and simple geometrical mosaics made of black and white tesserae have led to an increase in this type mosaics. In 1st Century AD those patterns were quite adopted and often the embellishments used on wall and ceiling decorations were preferred. Basic logic of this period adornments; was based on the contrast of black and white tesserae. Other characteristic features of the Roman Imperial Period are use of fish scale motif, saw tooth, key designs, reticulated forms, basket weave, and shell motifs

(Dunbabin, 2012). Later those motifs were enriched by adding new ones such as circles, squares, diamonds and star shapes.

Figure 2.10 Cave Canem mosaic, Pompeii (Tabanlı, 2007)

Apart from geometric forms stated above, it is possible to mention figurative and floral motifs. However those motifs are not similar with Hellenistic period mosaics. In Hellenistic Period motifs were three-dimensional though; in Imperial Era they are both two-dimensional and shaped as silhouette. Examples of this period mosaics are from Pompeii and Herculaneum (Clarke, 1979; Smith, 1983). Typical example of this period is the "Cave Canem" mosaic found in the Pansa house Pompeii (Dunbabin, 2012). During this period, along old mythological scenes, new and interesting topics were introduced in mosaics such as hunting, circus, marine scenes; the scenes with Dionysus and animal depictions. Generally made of black and white tesserae sometimes colors were introduced in the mosaics (Ramage & Ramage 1995).

Figure 2.11 Roman Period mosaic, Tunisia Archeology Museum (Tabanlı, 2007)

By the mid 2nd Century AD mosaic floors were completely settled on all states of the empire. In local workshops colorful mosaics were made imposing and with finest workmanship till the end of the Roman Imperial Era (Blake, 1930). Towards the end of the period most covered topics among geometric motifs are sea and mythological creatures Nereid[3], triton[4], hunting scenes, Olympic games and circus scenes. In Roman mosaic art, fish, tiger, pigeon, cat, bird, lion, Nile animals, war subjects were used. In early examples related to the sea, dolphins, anchors, three-pronged harpoon were the most popular motifs. Tesserae were considered as elements of color. Shading and contour lines reminds brush strokes techniques of oil painting. "Pigeons Drinking Water" or "Feast Leftover" such as fish bone, nut shells, fruit peels are also illustrated in this period Roman mosaics (Üstüner, 2002).

[3] Nereids are sea nymphs the fifty daughters of Nereus and Doris. They often accompany Poseidon, dance and swim with ancient dolphins and legendary creatures of the sea. Most famous ones are Psamathe, Galateia and Thetis (Cömert, 2010).

[4] Triton is son of the Poseidon and Amphitrite. He is half man and half fish; waving the sea by blowing through the Shell he is carrying (Cömert, 2010).

Figure 2.12 Roman Period mosaic, Capitoline Museum, Rome (Tabanlı, 2007)

2nd and 3rd Centuries AD showed a great progress in mosaic making especially in states rather than Italy. Mosaics were designed and laid on floors of luxurious houses. Frescoes and wall decoration lost its popularity and left its place to various colorful mosaics. When the technique had developed, artists started to cut tesserae smaller in size. Those colorful stones were combined with glass to complete the color palette and this situation leaded to create more vivid and dynamic mosaics. Frequently used motifs in Roman mosaics were meander, wave pattern, guilloche and pelmet and used in borders. These elements were located systematically and designed according to the composition. Main composition was located in the middle (Tabanlı, 2007). In Anatolia, Aegean, Mediterranean, Cilicia (Antioch) Regions, and Zeugma in South East Anatolia gave examples of those mosaics.

Figure 2.13 Roman Period mosaic, Vatican Museum, Rome (Tabanlı, 2007)

In Syria state, mosaic art was applied and used with a great success during the Roman Period and the most important examples in the entire Roman world was created here. Apamea mosaic examples date back to 1st Century AD. After 4th Century AD mosaic technique locally changed and geometric decors became popular instead of naturalist descriptions of Hellenistic era (Balty, 1989).

Figure 2.14 Deer mosaic from Apamea, Syria (Wikipedia, 2015)

Greece had never been a rich state of Roman Empire even though it hosts earliest examples of Hellenistic Period. Only a few examples date back to 1st Century AD. From 2nd and 3rd Centuries many mosaics were found in Akhaia and Peloponnesos. Apart from these centers, Sparta and Thessaloniki had fewer mosaic pavements in 5th Century AD. In Early Christian Period mosaics were used in floors of basilicas (Waywell, 1979).

North Africa mosaics are colorful and figurative; seasons and scenes from the Nile are among the fairly common topics covered. Guilloche, wave, ribbon motifs were found in Carthage (Özügül, 1996). Floor mosaic tradition was continued during the Early Christian Period. Outstanding examples from Jordan and Syria were continued to exist even in later times (Ling, 1998).

Byzantium Art and Mosaics

Byzantium art and civilization is known and investigated as one of the major civilizations for the mankind. The reasons for attributing this importance to Byzantium civilization and art are; its originality due to the various cultural impacts melting in same pot, maintaining its existence more than a thousand year, spreading a wide geographical area and have impacts exceeding its geographical limits and historical effects (Akyürek, 1997). Byzantium Empire was the richest and long lasting one in medieval Christian civilizations. It was founded in 324-330 AD when Emperor I. Constantine in Byzantium. Later on Constantinople became capital and Empire maintained its presence for eleven centuries (Vikan, 1998).

Early Byzantine Period is considered between 330-726 AD and 6th Century AD accepted as Byzantine Classical Period. Till Classical Period, Byzantine Art was affected from Roman Art and had significance with ancient styles though, after with the effect of Christianity Byzantine art had its own style (Haussig, 1971). Between 726-843 AD Byzantine Empire had a chaos in both political and religious approaches and emperors forbid the icons, which is called Iconoclast Period. In this period many mosaics including figures such as the ones in Chora and Hagia Sophia Museums were destroyed. After 843 AD Iconoclast period has ended and mosaics started to

adorn the religious buildings again. Late Byzantium period is when Byzantine art had its heyday such as renovation of Chora Church, its mosaics and frescos. This period ended when Ottomans conquered Constantinople.

In general, Byzantine Art had two different styles: capital style and states style. In capital style an artwork had to be designed worthy enough for empire's capital both in skill and technique. In particular applied in Byzantine palace and other important and leading circles, this style employed ancient art traditions, applied in a thoughtful way and workmanship in order to reflect the magnificence of the capital. On the contrary, the states style did not give importance to the beauty of figures or shapes, instead based on the religion and accepted art as a depiction of religion. From this perspective, the states style had adopted more primitive and simple artistic expression, and imitated the artworks in capital meanwhile used art as a tool of reaching people in the name of religion (Erkan, 2006).

Figure 2.15 Hagia Sophia mosaic, Istanbul (Kleinbauer, White, & Matthews, 2004)

In Byzantine Empire mosaic art had its roots from ancient times and developed as a continuation of Roman style. In ancient times mosaics were used as pavements and had functional concerns till 1st Century AD and after it became a distinctive feature of the building and used as an integral part of the architecture. However, in contrast to softness, fineness and sophistication of the ancient mosaics, Byzantine mosaics were committed to the tradition, had formalism of Christianity and function of

delineating the sacred with picture/mosaics. Along this Byzantine mosaic art had its own style by combining the softness and fineness of ancient techniques with its hardness (Orcasberro, 1998).

With the triumph of Christianity over paganism, wall mosaics generally took place in sacred buildings. Chromatic nuances and the glitter of gold were used in order to create an effective atmosphere for viewer (Bustacchini, 1973). Now mosaics were applied on walls and ceilings instead of staying under feet just in ancient times. Therefore in this period mosaic became a finishing material for walls and ceilings.

Figure 2.16 St. Apollinaire Church (Flickr, 2015)

In Byzantine art whether it is religious or not the main target is the audience. Especially religious art aims to impress the audience and intents to confront them directly with the sacred. In this sense mosaics are functional and are part of mystical dialogue with audience (Vikan, 1992). Architecture, interior decoration mosaics, material, lighting and music creates this mystical atmosphere.

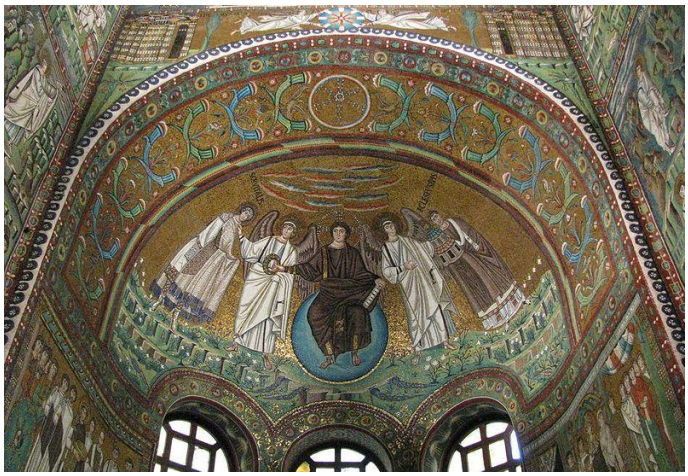


Figure 2.17 St. Vitale, Ravenna (Wikipedia, 2015)

Most important mosaics of Early Byzantine Period are from the capital of West Rome, Ravenna. In Ravenna between 5th-6th Centuries AD important buildings and mosaic activities took place. Examples from Ravenna are from buildings such as St. Apolliniare, Orcasberro basilicas or buildings with dome such as St. Vitale (Erkan, 2006). Even it was stated some of the layouts of the St. Vitale mosaics were sent from Constantinople. However in Ravenna style, there are some traditional rules which had been valid such as laying tesserae with sloping. Other important Early Byzantine Period mosaics are in Greece, St. Demetrius Church and Hagia Sophia in Thessaloniki. Apart from these, St. Catherina Monastery Church in Sinai Mountain, Egypt is one of the important examples protected till today (Tansuğ, 1999).

Figure 2.18 St. Catherina Monastery Church in Sinai (Tumblr, 2015)

The Iconoclast Period had become a complete destruction in terms of Byzantine art, the ban of figures influenced mainly Anatolia, Greece and Macedonia. However Italy was unaffected from this flow. In this period emperors destroyed religious mosaics and supported decorative ones without figures (Genç, 1994). In this period many icons were destroyed and replaced with crosses. St. Irene Church in Istanbul is one of the crosses created in Iconoclast Period. Hagia Sophia in Istanbul also has similar crosses.

Figure 2.19 Hagia Sophia Mosaic (Kleinbauer, White, & Matthews, 2004)

Figure 2.20 Hagia Sophia Mosaic (Kleinbauer, White, & Matthews, 2004)

Later Iconoclast Period had ended and a new era called Middle Byzantine Period for mosaics was started. Buildings were renovated and new mosaics were applied to the walls and ceilings. Hagia Sophia in Istanbul has important mosaics from this period. Late Byzantine period mosaics differ from Middle Period ones with the style where mosaics do not fit the church interior as before, instead look after its own special features. This style aimed to introduce the depth and tension with the plastic expression. The way it used color and lines to create dynamism, activeness had created natural and gracious artworks. Stories delineated were no more scary and harsh subjects but narrative expressions. Istanbul Chora Church has examples of this period.

Figure 2.21 Istanbul Chora Church Museum (Flickr, 2015)

2.2 Color and Tesserae Shape in Ancient Mosaics

In this section studies on color and tesserae traits of the ancient mosaics are presented. Studies related to this field are quite limited though there are few detailed catalogs on mosaics such as the ones prepared for Antioch (Levi, 1947; Campbell, 1988), Ephesus (Jobst, 1977) and Aphrodisias (Campbell, 1991). These studies investigate mosaics presenting the theme, subject, figures, colors regarding tipology.

2.2.1 Studies on Color

The development in mosaic colors is not significant just like the developments in materials, compositions, emblema and decoration are not. Along this, early mosaics composed of black and white tesserae after that colorful mosaic were introduced. This can be a cue of the color development in mosaics. Some colors were highly preferred in specific times and then lost (Şahbaz, 1999). One study deals with the colors and style of Antioch mosaics and only mentions the color names such as brown, orange, pink, yellow, white (Erdinç, 2002).

2.2.2 Studies on Tesserae Traits

Limited numbers of petrographic researches show that tesserae usually were obtained from local sources, rarely brought from remote regions (Dunbabin, 2012). Tesserae were made of limestone in different colors, marble, granite and sometimes of gems. Along these materials brick, tile, pottery, glazed ceramics used in mosaic making as well. Glass tesserae were preferred on walls and vaults due to their low resistance, only used in floor mosaics only in small details to make the patterns and motifs more attractive. Regular glass tesserae were produced from used glass though, for high quality mosaics colored frits were used (Johnson, 1982; Uğuryol, 2005). There are no studies on tessera shape and sizes so far. This study tries to offer a new approach to the subject.

2.3 Mosaic Centers of Anatolia

2.3.1 Middle Euphrates Mosaics in General

Southeast Anatolia was divided into two parts. Middle Euphrates is one of these parts that include provinces of modern Adıyaman, Gaziantep and Şanlıurfa. These fertile lands around Euphrates and its tributaries were inhabited all time; along being one of the important trade roads going to East, India and China. Especially Commagene Kingdom's capital Samosata (Samsat) and center of Osrhoene Region Edessa (Şanlıurfa) were two important places of this trade road.

Euphrates made region a suitable place for the mosaic art provided. Numerous villas with mosaic floors have been unearthed at Zeugma in recent years. At Samosata on the contrary only a small group of mosaic has been brought to light at palace building. Unfortunately both ancient cities had same destiny and were inundated by dam constructions. Edessa is the city where many mosaic groups have been discovered in rock cut tombs peculiar to the city and they display local features. Only a small group of discovered mosaics could have been properly recorded and brought to the museums at Istanbul and Şanliurfa; rest were lost or damaged only recorded with photographs. Some of the mosaics were illegally brought abroad and kept in museums or in private collections. All these findings point out clearly that region

was quite productive for the mosaic art in some periods. In addition it should be noted that, quite many mosaics lie under waters of dams in Zeugma and Samosata, or await to be discovered under the modern houses built on them at Şanlıurfa (Salman, 2007).

Figure 2.22 Ancient Map of Anatolia (Barrington Atlas, 2000)

Middle Euphrates was divided into two regions: Commagene Kingdom and Osrhoene Region. Mosaics were generally located in the cities bordering or neighboring Euphrates which are from Late Hellenistic Period to Late Roman Era. Samosata and Arsameia have Hellenistic mosaics. Roman mosaics, belong to 1st and 2nd Century AD, were found in Zeugma and Edessa (Salman, 2007).

From Osrhoene Region, Mas'udiyeh (Mesudiye), Birtha (Birecik) and from Commagene Perrhe (Perre- Örenli) gave mosaic examples also. Along these, Sarrin (Serin) in Osrhoene and Bahasna (Besni) in Commagene have limited examples belong to late period.

Hellenistic mosaics are in the typical features of this period. However pebble mosaics are not seen in the region. Arsameia and Samosata mosaics are in same style, especially including emblems with ancient dolphins and borders with geometric patterns. Similar border compositions are seen in Delos (Greece) and Pergamon (West Anatolia). Opus tessellatum technique was employed and tesserae size grows from center to borders. Each part tesserae line has tesserae of same size and smaller in figures however any additional information related to tesserae traits is not found (Salman, 2007).

Roman era mosaics belong to 2nd and 3rd Century AD and mostly found in Zeugma and Edessa. All mosaics include figurative compositions. Zeugma has mythological subjects though daily matters were illustrated as well. Figure style, compositions and border patterns reveal a workshop identity and style close to Antioch mosaics. Opus tessellatum and vermiculatum were employed. In northern Syria, Zeugma and Antioch (Cimok, 2000) are the most intensive production centers of mosaics.

The mosaics of Edessa were the production of a local workshop. Unlike other settlements, here mosaics were unearthed in the rock-cut tombs peculiar to the city and products of half a century workshop. They are mostly figurative and illustrate family members. In addition there are mosaics depicting Orpheus and Phoenix. Borders of the mosaics are in congruent with Zeugma and Antioch mosaics, whereas matters and style are significantly different. Only opus tessellatum is employed and tesserae size is same in all of the mosaic. Mas'udiyah mosaics are in same style with Edessa mosaics and illustrate Euphrates river deity and points out a local workshop. Another settlement Birtha has two pieces of mosaics with Heracles and has entirely Roman features that indicates it is depended from Edessa workshops (Salman, 2007).

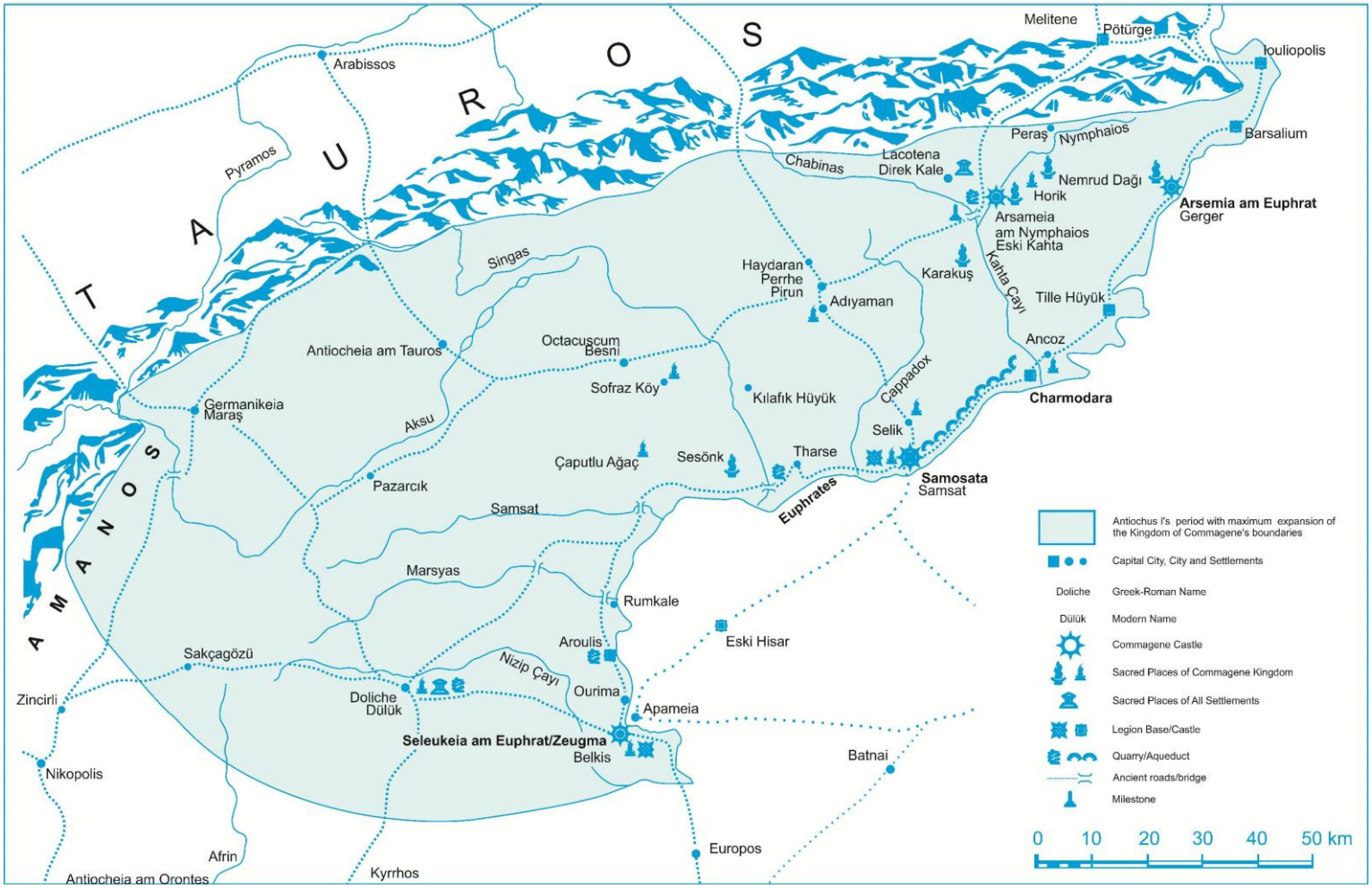


Figure 2.23 Commagene Map, (Y. Tanrıverdi, adopted from Wagner, 2000)

One of the important Commagene settlements, Perrhe had unearthed mosaics which are in Adıyaman Museum. Also examples seen in the past and recent excavations indicate the intensive mosaic treasure hosted by the region (Eraslan, 2004). The examples from the museum include floral themes and animal depictions.

Figure 2.24 Perre Mosaic (Eraslan, 2004)

The scenes from unearthed and unrecorded mosaics and examples in museum give an impression of Perrhe mosaics are ichnographically in a style where natural environments and conflicts between animals were illustrated. In latest excavations a geometrical mosaic was unearthed which shows the variety of compositions in Perrhe mosaics (Eraslan & Karaca, 2009). Border of the mosaics indicate 2nd and 3rd Century AD, it can be stated that there was a production until then. Late Roman Period mosaics are quiet limited and along two mosaic examples from Edessa and Samosata; Haleplibahçe mosaics are similar to the 5th and 6th Century AD Syrian mosaics. In style they are almost identical with Antioch Yakto Complex mosaic (Dunbabin, 2012) and Amazon hunting mosaic from Apamea (Duliére, 1968; Eraslan, 2014).

Figure 2.25 Amazon Mosaic (Urfakültür, 2015)

Figure 2.26 Amazon Mosaic (Duliere, 1968)

Late period mosaics obtained from Sarrin and Bahasna have similar style of Hellenistic and Roman period mosaics of the region. Especially Samosata and Arsameia mosaics have significant border compositions. In the middle there is emblema and geometric motifs surround it. Border is an important factor in Zeugma mosaics as well which acts as a completing element in the composition. However in Edessa mosaics borders still exist but the area they were used was limited compared to same period mosaics.

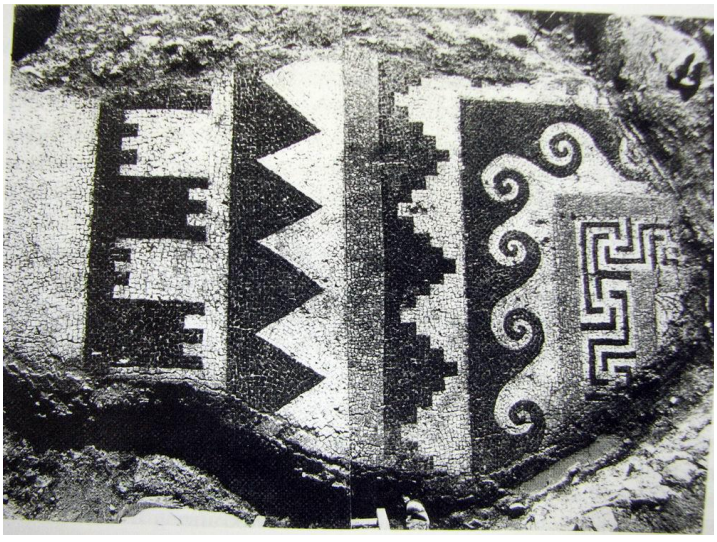


Figure 2.27 Arsameia Ceremonial Mosaic (Salman, 2007)

In borders (Balmelle, et al., 1985) some motifs were used in common. Wave motif is one of them and was so popular since from early pebble mosaics. Examples of this motif can be seen in Hellenistic mosaics of Erythrai, Olynthos, Pergamon and Delos (Dunbabin, 2012) and also in Arsameia, Samosata, Zeugma (Ergeç, 1995) and Edessa mosaics. Turreted wall is only seen in Arsameia Hellenistic mosaics in southeast though; Delos and Pergamon also give example of this motif. Crow step can be seen in Arsameia, Samosata, Edessa and Zeugma mosaics. Other types of motifs are meander which can be seen in all groups of mosaics; bead-reel only seen in Arsameia and Edessa and guilloches in Zeugma (Ergeç, 1999), Edessa and Perrhe mosaics. Motifs used in Middle Euphrates Region are presented in Table 2.1 including the terminology of the motif names.

2.3.1.1 Commagene Region

The kingdom of Commagene (162 BC- AD 72) comprised the area of southeastern Anatolia between the Persian and Roman empires as a buffer state. The region includes the present-day Turkish provinces of Adıyaman, Kahramanmaraş and Gaziantep. The capital of the kingdom, Samosata, was located on the west bank of the Euphrates River. The reign of the Antiochus I (69-36 BC) marked the golden age of the kingdom. In the most ancient times region was subjected to both Assyrian and Hittite rules. This period archeological and philological evidences were uncovered during the excavations in Yesemek, Sakçagözü, Zincirli and Kargamış (Dignas & Filges, 1991).

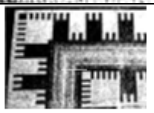
The earliest recorded name of the region was “Kummuh” and described as an area covered with cedar forests. Another natural wealth of the region was iron; sources mentions that Kummuh was where iron was born. This was reflected in popular religious cult of the people, the cult of “Jupiter Dolichenus”[5] Commagene deity, spread as far as Europe during Roman times. Dülük Baba in Gaziantep is remote relic of this ancient cult (Blömer & Winter, 2011).

[5] Zeus riding a bull and holding a thunderbolt and a dagger

There is a blank period in the history of Commagene from 7th century BC until the mid 1st century BC. Written documents and culture reappeared during the reign of King Antiochus I in the Hellenistic age. However, those texts composed in Greek were propaganda of the Kingdom as a heritage of Parthian and Greek empires centered on the person of the king neglecting the social and cultural life of people (Dignas & Filges, 1991). Antiochus I had erected a stele in Sofraz village (Adıyaman) where he handshaked with Apollo claiming the deity was his ancestor. Similar steles are seen in Nemrud Mountain where the king built a sacred tomb for himself. This glorious mausoleum includes terraces, deity statues, steles and inscription explaining the religious rituals of the tomb. King put his own statue next to the deities, naming himself god-king of the Commagene (Blömer & Winter, 2011).

Even though most of the buildings remain missing today, excavations show that mosaics in Commagene Kingdom appear in Arsameia and Samosata in Hellenistic style. According to Salman (2007) those mosaics did not have local elements; compositions were obtained from pattern books of the time. Zeugma and Bahasna mosaics are mentioned under Commagene Region as well.

Table 2.1 Motifs used in Middle Euphrates mosaics (Adopted from Özügül, 1996; Balmelle, et al., 1985)

Dalga	Waves/ sea waves/wave crest	vagues/postes	wellenband/laufender Hund	continuous curving motifs on same plane, first they rise and curves towards its center. Always two dimensional and in colors of red blue and black	
kuleli şehir duvarı	turreted wall	muraille, rempart, murs, enceinte	stadtmauer	there is a silhoutte of a dented wall and dented towers	
üçgen dizisi	crowstep,merlon	ligne de triangles denteles,ligne de triangles a degres	zinnenmuster, zinnenband	a motif composed of triangels lined up side by side. Always in two colors.	
menderes	meander/maeander	meandre	maander	serpentine shaped motifs as a part of the valley or the riverbed serpentine şekilld	
boncuk ve pul dizisi	bead and reel	perles et pirouettes, ligne de cabochons	peristab, perireihe, schuppenreihe	ionic and korinth style of decoration in ancient architectural ornaments	
İki kollu örgü	two strand guilloche	guilloche/tresse a deux brins	flechtband	two strands wound together and continuously form a pattern	

2.3.1.1.1 History of Arsameia- Commagene Region

In Commagene Region there are two settlements called Arsameia. First one is Arsameia on Euphrates which is in today's Gerger (Adıyaman) and includes ruins of castle, a relief of II. Samos who was Antiochus I'st ancestor and inscriptions put by Antiochus I. Those inscriptions are similar to the ones found in the other Arsameia on Nymphaios (Kahta River).

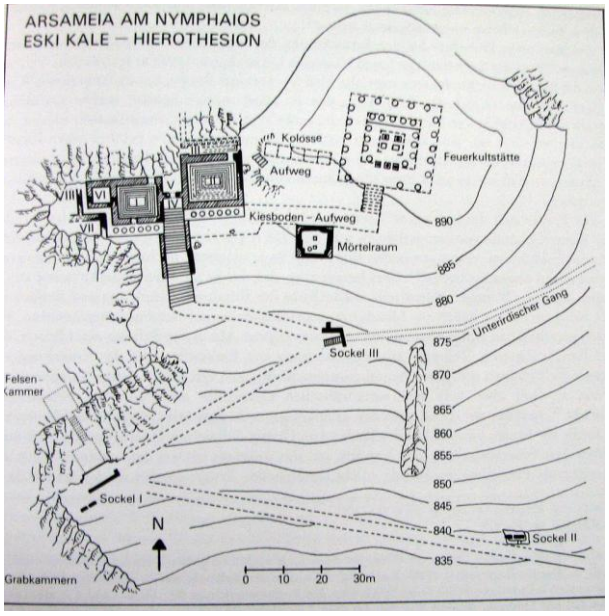


Figure 2.28 Arsameia (Salman, 2007)

Arsameia on Nymphaios was located at north of the Samosata, discovered and unearthed via systematic excavations conducted by F. K. Dörner. Founder of the city was Arsemes who was ancestor of the King Antiochus I (Hoepfner, 2000). Dörner (1999) stated that the city includes a Hierothesion[6] that belonged to Antiochus I'st father Mithrades Callinicus. Antiochus I. had staged important architectural facilities in the city. According to the inscriptions found in the ancient city, the king constructed a new fortification wall, a new water network and some new buildings. Along these, city was used as an arsenal, thus; defense of the settlement was

[6] Sacred graveyeard belongs to royal family.

strengthened (Akurgal, 1985). However Blömer and Winter (2011) mentions that Arsameia on Nymphaios may not be a big and occupied city, since the excavations could not reveal a settlement close to the area.

2.3.1.1.2 Arsameia Mosaics

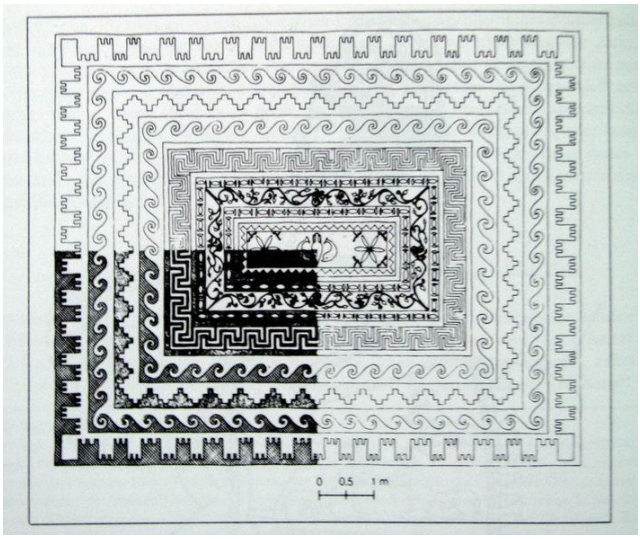


Figure 2.29 Arsameia Mosaic (Dörner, 1999)

Arsameia mosaics were found in the Hellenistic ceremonial spaces of the city. There were two rooms with mosaics and two small mosaic pieces close to these rooms though none of the mosaics were secured as whole. Still mosaics are good information sources of the border motifs of the era (Figure 2.27).

First mosaic pavement was found in 1954 at the edge of the slope at the northwest side of the old castle, at approximately one meter below the surface. Part of the center and the southwest corner of the mosaic were almost completely preserved, while scattered tesserae were found around the plateau and south slope. The pavement was in many areas discolored probably as the result of a fire, indicating that much of the destruction took place in antiquity. The remains of the architectural settlement which the mosaic belongs were almost completely destroyed during the

construction in the Middle Ages that began after the 10th century and later (Lavin, 1963). According to the place it was found mosaic was rectangular 10.60 x 8.30 m. with the long sides oriented almost exactly east-west, the short sides north-south.

The tesserae of the borders are roughly cubic in shape varying from 1 to 3 cm. are of stone. Three main colors were recorded: black (bituminous limestone), pink (limestone), and white (limestone). Reddish terracotta seems to have been used occasionally as well. The elements of the central panel contain much smaller tesserae down to 0.5 cm. Tesserae were laid in rows, following generally the contours of the design.

The mosaic is composed of a series of decorative borders surrounding a central, rectangular panel. Reading from outside inward, the borders are as follows; a plain white outer fill, pink and white crenellations (turreted wall), pink and black wave-crest border, white and red step (pyramidal crow step) border, another border of wave-crest in black and white, black and white meander framed with light red borders, white bead-and-reel border on black background, ivy-scroll border, second bead-and-reel border and saw-tooth border (crow step) in black and white framed with a red border (Lavin, 1963). Those borders are also mentioned in Table 2.1 are important sources to date the mosaic.

Second mosaic pavement is a piece of whole only has borders which are black turreted wall on white background, black crow step, red band, pyramidal crow step, waves and meander motifs. Colors are in congruent with the first mosaic.

A notable feature of the both pavements is its general composition as a series of borders framing a central panel which was observed as a design principle characteristic of Hellenistic pavements. In this kind of design is that the central element is small in relation to the elaborate framing devices that surround it. Pebble mosaics rarely have more than two or three borders around the main composition, which occupies the greater proportion of the area covered by the mosaic. Similarly, in "Roman" pavements of the 1st century BC the borders are again reduced in number. Therefore Arsameia mosaics are considered as Hellenistic mosaics which belong to 2nd Century BC when compared to the similar designs of period such as Alexandria, Pergamon, Lykosoura, Malta, Delos, and Pompeii (Lavin, 1963).

2.3.1.1.3 History of Samosata- Commagene Region

Commagene Kingdom's biggest and capital city Samosata was located 37 km away from Adıyaman, 54 km away from Şanlıurfa and dates back to 5000-3000 BC according to the archeological artifacts. On the west bank of the Euphrates, the city was founded between Nymphaios and Singa (Göksu), was an important passage on Euphrates and at junction of military base and trade roads. Therefore city was suitable to occupy with its moderate climate (Özgüç, 1985). Early studies on Samosata were done by K. Humann, O. Ouchstein, O. Hamdi Bey, Osgan Efendi and T. Goell (Salman, 2007). Salvage excavations by N. Özgüç clarified the history and archeologic value of the city. Those excavations are the most systematic and detailed research on Samosata. Palaces, aqueducts, castles and similar buildings, jewelery, coins and bullas were unearthed and some were sent to Adıyaman Museum (Parlak, 2006). Samosata had the largest growth under Antiochus I'st reign. Fortification walls were constructed at this time period. When the Commagene Kingdom had fallen, Romans controlled the city (17-38 AD). Samosata became a military base against Parths and 16th Legion was brought to the city. Roman Bridge (Cendere Köprüsü) was built on Nymphaios. At 3rd Century AD Samosata lost its military importance and remained unimportant till Byzantium Period and city was reconstructed. Later the city went under the domination of Armenian and Islamic powers (Özgüç, 2009).

2.3.1.1.4 Samosata Mosaics

Samosata mosaics are mosaics found in the palace of I. Theos Antiochus and belong to Hellenistic Period (Bingöl, 2013) and one Late Roman Period mosaic which are in Adıyaman Museum's archive. Samosata palace mosaics are the mosaics unearthed in the excavations headed by Nimet Özgüç between 1978-1987 years. During excavations fifteen levels of structure were found from Early Bronze Age to middle ages. A Byzantium mosaic was found in the ruins of a Justinian building which could not be identified (Özgüç, 1985; 1986). Rest of the mosaics was obtained from the Late Hellenistic (Zoroğlu, 2000) palace building unearthed. Samosata palace was the most glorious building found in the acropolis excavations. The fact that limited

mosaics survived to this day, and only a few examples are in the Adıyaman Museum today hardens to analyze the technical and iconographic features of the mosaics (Salman, 2007). In the excavation six floor mosaics were unearthed and carried to the museum. Only one is being exhibited currently, rest is in the basement of the museum. Analyze and investigation of the mosaics could not be done properly due to the storing conditions which are being shown in the photographs.

Figure 2.30 Samosata Mosaics, Adıyaman Museum (from Osman Dolaş's archive)

Figure 2.31 Samosata Mosaics, Adıyaman Museum (Salman, 2007)

The only mosaic which is in exhibition is the middle part of the best protected mosaic from the palace's B1 numbered room named as the mosaic with fishes. Fishes are illustrated on a black background in emblema its edges were bordered with a monochrome dusty rose stripe. Technically one of the most important details is the size of the tesserae in emblema and neighboring 20 cm area. In these areas tesserae are smaller than one centimeter in figures, especially in the eye and teeth tesserae size descends to two millimeters. In the borders tesserae size increases going outwards up to two cm. In the borders opus tessellatum technique is seen. Analysis with fish mosaic (center part) was easier compared to the other ones which were stored on top of each other in the basement.

2.3.1.1.5 History of Perrhe- Commagene Region

Perrhe city was (Eraslan & Karaca, 2009) one of the most important cities of the Commagene region which is five km away from Adıyaman city center. The city was geopolitically important since it was located on the road that connects Melitene (Malatya) to Samosata. The water from fresh springs of the Perrhe was so popular that passengers and caravans spent the nights here (Blömer & Winter, 2011). There is still one fountain in the Örenli district. Today necropolis of the city is visible. Excavations have been done by Adıyaman Museum since 15. 06. 2001. According to the Eraslan, and local people there are mosaics in the region which has not been recorded yet. Mosaic pavements have continuity till Byzantium period though majority of the mosaics belong to Roman Period (Eraslan; Zeyrek; Özman; Şancı; Akın; Arslan; Alkan; Karaca & Koca, 2010).

2.3.1.1.6 Perrhe Mosaics

Figure 2.32 Perrhe Mosaic (Y. Tanrıverdi, 2015)

Figure 2.33 Perrhe Mosaics, Adıyaman Museum (Salman, 2007)

In general, Perrhe mosaics depicted scenes from nature with animal illustrations on it. There is a mosaic in the Adıyaman Museum from Perrhe which belonged to a building with apse. Mosaic is colorful, and made with opus tessellatum technique.

Animals are illustrated with a contour made of two lines of tesserae in opus vermiculatum technique. There is no border motif on the mosaic but rosettes to fill the background. There are some pieces which are thought to be Perrhe mosaics. There is guilloche motif (made of six twisted ropes which is a first for region), along this, meander motif is seen in the examples. Latest excavation gave an example of geometrical mosaic from region also. Meander motif used in the Perrhe mosaics is similar to the ones used in Masada (Syria) region. Some other similar elements are seen between Perrhe mosaics and Masada mosaics such as ribbed bowls or floral mosaics with animals (Salman, 2007). In methodology part mosaic tesserae samples from Perrhe obtained from Adıyaman Museum were studied for colors and investigated with X-ray diffraction analysis.

Figure 2.34 Detail from Apse Mosaic (Y. Tanrıverdi, 2015)

Figure 2.35 Perrhe Mosaic (Salman, 2007)

2.3.1.1.7 History of Bahasna (Besni) - Commagene Region

Bahasna is one of the oldest districts of the Adıyaman and was an important administrative and military settlement. There are no artifacts belonging to ancient era therefore the role of the settlement in Rome still unknown. Old city was four km away from the new Besni. There are ruins of a castle which is surrounded by mountains. Only south gave entrance to the castle therefore in south two lines of fortification walls were used. However, only one turret is left from walls.

Archeological remains includes inscriptions belonging different eras including Ottoman Period though detailed studies have not been done so far (Blömer & Winter, 2011).

2.3.1.1.8 Bahasna Mosaics

Bahasna mosaics were found in Haraba (Adıyaman) village and inventoried in five pieces at Adıyaman Museum. Mosaics are multi-colored including the colors of white, brown, yellow, green, black, burgundy and blue (Salman, 2007). Tesserae sizes are around 1-2 cm and 55-77 tesserae were used per dm^2. Salman (2007) claims that only one mosaic piece differs from the others and may belong to another pavement. The settlement and building mosaics were excavated is unknown therefore it is hard to date the mosaics though in museum records they are dated at Late Roman Period. Meander, hexagons, squares, flower shape and rectangles are the motifs of the mosaics.

Figure 2.36 Bahasna Mosaic (Salman, 2007)

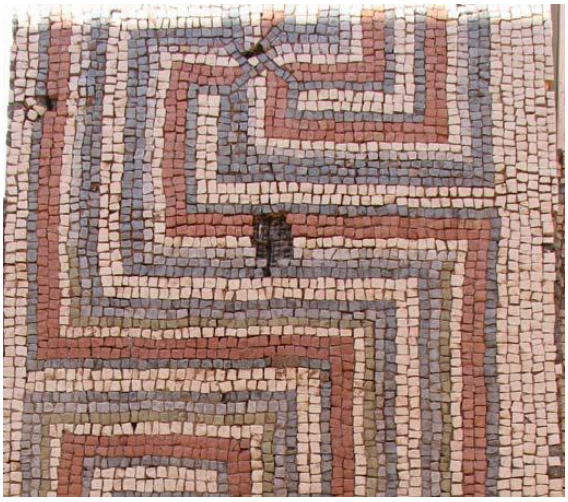


Figure-2.37 Bahasna Mosaic (Salman, 2007)

2.3.1.1.9 History of Zeugma- Commagene Region

Zeugma is one of the two important passages on Euphrates – the other is Samosata- where Alexander the Great got through to the east with his army. One of his commanders Seleukos I Nikator settled two cities on both sides of the river in 312-281 BC, one is Seleukeia am Euphrat on the west and the other is dedicated to her wife Apama, Apameia am Euphrates. Then this city became of one the most important four cities of Commagene Kingdom. Later in Roman era it became one of the military base therefore had its heyday in 1st and 2nd centuries AD Zeugma had its name in Roman era which means "bridge-passage" (Ergeç, Önal & Wagner, 2012; Görkay, 2010).

Figure 2.38 Zeugma Villa (from O. Dolaş's archive)

Zeugma experienced an invasion and was fully destroyed by the Sassanian King, Sapur I in 256 AD. The invasion was so dramatic that Zeugma city was not able to recover and thrive for a long time and after that the city were hit by a violent earthquake which buried it beneath rubble. In 4th Century AD Zeugma settlement became a Late Roman territory. During the 5th and 6th Centuries the city was ruled over by the Early Byzantine domination. In the 10th and 12th centuries a small

Abbassid residence settled in Zeugma. Finally a village called “Belkis” was founded in the 17th century (Ergeç, 1995).

Zeugma had almost everything which would exist in the best Roman cities. Therefore the city was completely a depiction of the Roman life style and settlements in ancient times. There are 13 villas with mosaics found in Zeugma. They were built on terraces facing the river Euphrates. The house style was the replica of Roman houses though similar to Antioch or Ephesus houses built on hills (Önal, 2000).

Figure 2.39 Mosaic from Zeugma Villa (Y. Tanrıverdi, 2015)

Houses were located on slopes of the hills next to Euphrates River. Each house row was on a patio and had generally two entrances. One was at the lower terrace at the ground floor and one at the higher terrace at the upper floors. House style is similar to Roman houses including a peristyle -columned courtyard in a building that may contain an internal garden- (Önal, 2013). Almost all of the houses faced north. More consideration was given to the protection from the summer heat than the cold of winter, and the houses’ guest rooms were designed to be the coolest spaces during the summer (Görkay, 2012a). Rooms surrounding the peristyle had doors or windows

to take fresh air and light. Houses are around 700m^2 and have 15-25 rooms. Water was the key element of the houses. Since they could not use Euphrates' water due to the location of the houses, water sources in mountains and hills were used by carrying them via canals. Due to the hot climate shallow pools called impliviums were constructed in peristyles as architectural elements to collect rainwater. Sometimes fountains were used in pools to give an aesthetic value to the house. In shallow pools mosaic floors were used. Themes of mosaics in pools were generally related to sea, river, sea animals and gods (Görkay, 2012).

Zeugma villas were luxurious Roman houses adorned with mosaics which were used with both aesthetical and functional concerns. First of all, because of the hot climate, a floor made of stone was helpful to cool down the interiors. Apart from that, advanced mosaics were used to show off the status of the owner of the house. It is also known wall of the rooms in villas were adorned with mural paintings that exhibit gods, goddesses, beautiful birds, or animals along geometrical patterns and sometimes Greek writings (Önal, 2000). Studies show that there are at least 2-3 layers of frescoes belong to different eras. Those were generally in congruent with the floor mosaic. Calcite was the common material of the murals and colors were obtained from graphite (black), vaterite (white), malachite (green) etc. from the materials and minerals found in the region (Akyol, Kadıoğlu, & Demirci, 2011). Önal states that (2013) after 200 AD quality of mural paintings descends while the quality of floor mosaics ascends. Most of the floor mosaics of Zeugma dates back to this time period.

2.3.1.1.10 Zeugma Mosaics

In Zeugma Roman mosaics are seen intensely. In very general terms Zeugma mosaics have reached a level to be compared with Antioch mosaics where was a mosaic center with a mosaic school; and Palmyra where Zeugma had cultural and art exchange with (Ergeç, 1995).

Figure 2.40 Tablinium mosaic, Zeugma (http://hayatbirmozaik.com/2010/12/22/mozaik-sanatinin-gelisimi/attachment/1591/)

Because of the dam construction, emergency excavations were conducted in the site. 39 mosaics were found in gymnasium and Roman bathhouse excavations. When the excavations legally started- since it is known that the site was excavated illegally since 1960s and lost many invaluable mosaics which were taken to abroad either to museums or to private galleries- two tombs were found and there was a terrace in the entrance with some statues and reliefs which is a tradition of Commagene Kingdom. In 1992, a Roman Villa was found; two of the rooms were decorated with floor mosaics, one was a geometrical one and the other contains mythological figures. It was observed that the walls surrounding these rooms were also decorated with frescos. Because of the rock floor, mosaics were lacking the blockage layer so it was not possible for thieves to cut and remove them. According to the plan of the villa, the space its floor decorated with figures was peristyle and the other room was tablinium. Architecture, frescos and mosaics show that villa belongs around to the time period of 200 AD (Ergeç, 1995).

Tablinium mosaic is 5.40m x5.00 m and a geometrical one as seen in Figure 2.37. The main colors are white, yellow, pink, red, grey, blue and black and their tints or

shades. In total there are 10 colors. Peristyle mosaic is wedding of Dionysus and Ariadne. It contains seven colors, their tints and shades in total 13 colors; here artists create the effect of light and shadows in mosaic. Regarding the style and techniques mosaic is addressed to second half of 2nd century AD.

Figure 2.41 Gypsy girl, Zeugma (from O. Dolaş's archive)

In 1998-1999 Acratos and Gypsy Girl mosaics were found. In most of the pools, mosaics related to water elements and gods, were obtained, Oceanus and Tethys with sea animals is one of the examples. In winter excavations continued and Achilles and Odysseus mosaic was unearthed. In twin villas excavations, the plans of the houses were recorded and 17 mosaics were carried to the museum. Four were geometric mosaics and rest was depicting mythological scenes. Achilles, Muses, Eros-Psyche, Euphrates River Gods, Demeter, Dionysus-Telete-Skyrtos, Perseus-Andromeda, Zeus- Antiope, Galatia, Poseidon-Oceanus-Tethys, Dionysus-Ariadne, Birth of Venus, Satyr-Antiope were the unearthed mosaics (Ergeç, 1999).

Zeugma mosaic collection is very rich compared to other mosaics obtained from Commagene Region. To ease the investigation a theme is selected to limit the mosaics to study. When the subjects of the mosaics are reviewed deity of wine-Dionysus was mostly preferred. Known as an Anatolian deity, Dionysus is popular

among Anatolia, Greece, Cyprus and Syria. Selecting mosaics with Dionysus would enable future studies to compare between different geographies. Brief information about Dionysus' life and mosaics are presented in following sections.

2.3.1.2 Osrhoene Region

Osrhoene Region mosaics include Edessa, Mas'udiyah, Birtha and Sarrin mosaics. This region mosaics are not included in this study however are mentioned in literature review for future studies and for their relatedness to the Commagene Region.

Figure 2.42 Osrhoene Region (Y. Tanrıverdi, adopted from Salman, 2007)

Edessa and Its Mosaics

Edessa, located in the southeast of Turkey is the center of the Middle Euphrates. Northern, western and southern borders are Euphrates, and eastern border of Edessa is Karaca Mountain and Tigris River. With its fertile lands, natural water springs and appropriateness for the east and west trades put the city an important place to own in history.

In ancient times two important military and trade roads were passing through the region. The one at north starts from Nineveh (Iraq) to Nusaybin (Turkey) and then to

Birecik (Şanlıurfa), from here road was divided into branches going to Antioch (Turkey), Aleppo (Syria) and Iskenderun (Turkey). Second road starts from Ktesiphon-Medayin (North India-Iran) going to Karhae (Harran) passing through Ras al-Ayn (Syria), Ceylanpınar (Şanlıurfa). Branches of this road were reaching Birecik and Aleppo. The importance of these roads was also increasing the value of the region. Along roads, Euphrates, in the region which connected Iraq and Syria and also India Ocean and nearby countries to West world had importance for the ancient world (Işıltan, 1960).

Edessa located in the wide arc of Euphrates, included a rich hinterland at the same time, far enough from the river to take notice from the attacks coming from west. It was 85 km east of Zeugma and Birtha, and 45 km southeast of Samosata, cherished by natural water sources (Segal, 2002).

At 303-301 BC Seleukos Nikator I conquered the city and Seleucids started to govern when it took the name "Edessa". This name was belong to Vodena (Macedonia) where was Seleucids' capital city. Probably this new city with its natural waters springs reminded them their homeland and took this name (Segal, 2002). After 163 BC Seleucid lost the active politic power in Mesopotamia and their government in Edessa weakened. In upper Mesopotamia Parthian domination had started and Seleucid lost their reign before they totally lose their existence in Mesopotamia (Yıldırım, 2007). However due to the authority gaps at 132 BC a local kingdom was founded in the region. Edessa was the capital of the kingdom, and it was located between Euphrates and Tigris which will name as "Osrhoene" later. Along Edessa, Birtha, Batnae (Suruç), Sarrin and Karhae (Harran) were important settlements of the region (Salman, 2007).

This new kingdom, known as The Kingdom of Edessa, was dominant in the region from 132 BC till 242 AD and Aryu was the first king of the kingdom. Kingdom period provided Edessa to remain its peculiar cultural texture and develope it. Kingdom also took a stand against the Roman Kingdom and generally allied to those were close to its own culture including Armenians and Parthians. However similar to Zeugma, the Kingdom of Edessa remained between Parthia- Roman contention. Therefore for the benefit of Kingdom sometimes convergences with Rome or Parthia

occured. When the Kingdom collapsed, Roman took the control over the region at 165 AD. Later, Edessa became a protected city between Sasanid and Roman Empires.

Figure 2.43 Border detail from Animal Mosaic, Şanlıurfa (Salman, 2007)

Edessa mosaics appears to be the production of a local workshop different from the familiar style of Greco- Roman art. Regional features and techniques of local artists are distinguished from the images portrayed in the original style (Dunbabin, 2012). Salman (2007) mentions that, an important amount of Edessa mosaics belong to local Aramaic-Syriac kingdom period. Mosaics are funeral mosaics or the ones with Phoneiks and Orpheus delineations. Borders are the same as those contained in the standard repertoire of Greco-Roman style pavements. However Haleplibahçe mosaics belong to 5^{th} -6^{th} Century AD and are similar to Syrian mosaics in style.

Four of the Edessa mosaics are in Şanlıurfa museum, Aphtuha mosaic is in Istanbul Archeology Museum, and in Hagia Irene there are five pieces. Two pairs of the pieces belong to same pavements. One pair is parts of Üçayak Mosaic and the other is parts of Funeral Feast mosaic. Azimos and Monimos mosaic is being exhibited in

Istanbul Sadberk Hanım Museum. Along these, Abgar mosaic was found in 1979 recorded and buried again. Some recorded mosaics are lost today such as Phoneiks mosaic (Salman, 2007). Example of mosaics are given in Figure 2.42, 2.43, 2.44 and 2.45.

Figure 2.44 Orpheus Mosaic, İstanbul Archeology Museums Administration (http://www.kulturvarliklari.gov.tr/TR,50937/dallas-sanat-muzesinden-iadesi-saglanan-orpheus-mozaigi-.html)

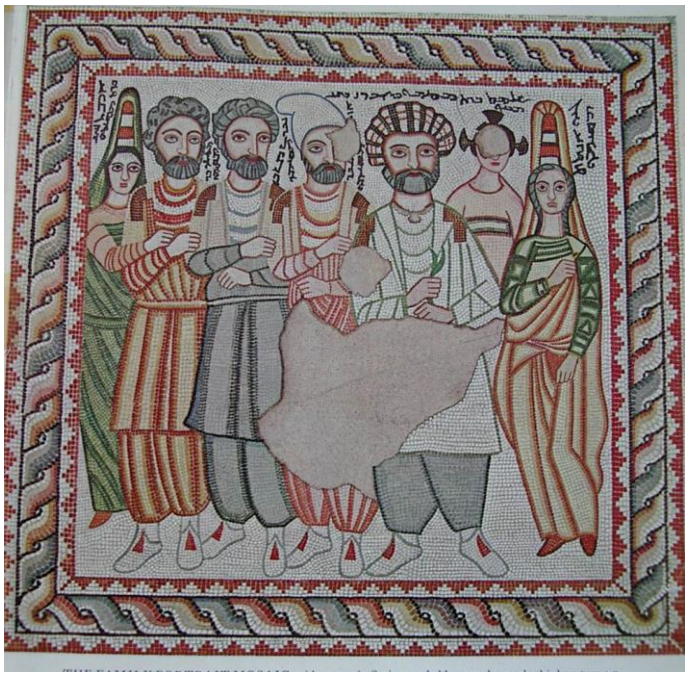


Figure 2.45 Family Portrait Mosaic (Salman, 2007)

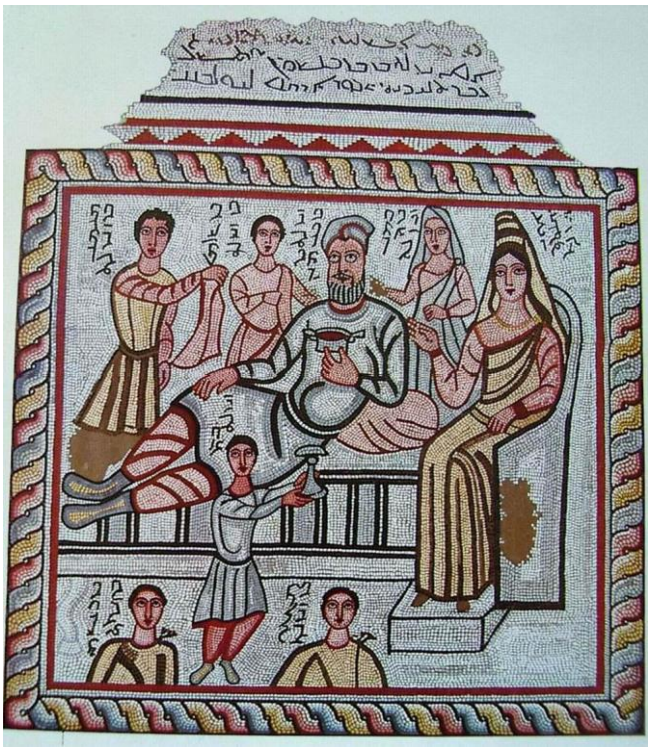


Figure 2.46 Funeral Feast (Salman, 2007)

Figure 2.47 Azizos and Monimos Mosaic, Sadberk Hanım Museum (Salman, 2007)

Mas'udiyah and Its Mosaics

Mesudiye (Osrhoene) is located in south of Edessa on Euphrates. A little is known about the settlement. Mosaic found in Mas'udiyah is late period of The Kingdom of Edessa under Roman domination. Mosaic was found in a 20 meters hill that also includes remains of walls and mortar. It can be thought a small family or community was settled in this place. The slope also protected the people from floods. Wall remains indicates the slope was housed for some time (Parlasca, 1983).

Researcher Von Oppenheim discovered the mosaic in 1899. He named the slope mosaic found as "Harabe Yamacı", and dated the ruins to Assyrian Period (Parlasca, 1983). The information about mosaic is only from the researches and publications it was mentioned. Today mosaic is crumbled and disappeared (Levi, 1947; Balty, 1989; Aksoy, 2007).

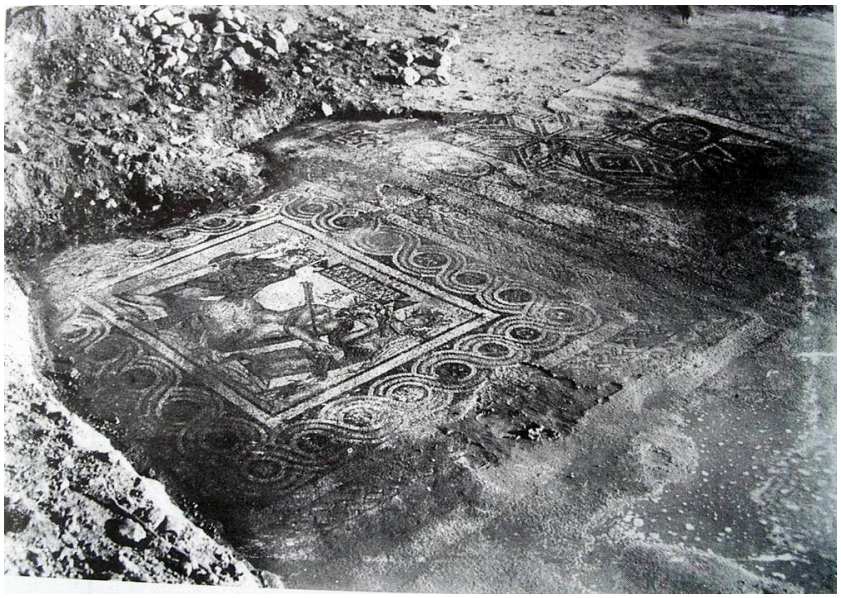


Figure 2.48 Mas'udiyah Mosaic (Parlasca, 1983)

Dimensions of the mosaic is recorded as 166x40 cm but Salman (2007) states that panel should have been square therefore there may be a mistake with the dimensions. As seen mosaic have a lighter (probably white) background in color. Three figures

are illustrated and the middle one is Euphrates the river god who is also seen in Zeugma mosaics. His name is written next to his head in Syriac which is common in Edessa mosaics. And there is Greek inscription on upper part of the mosaic in a tabula ansata including the date and signature of the artist.

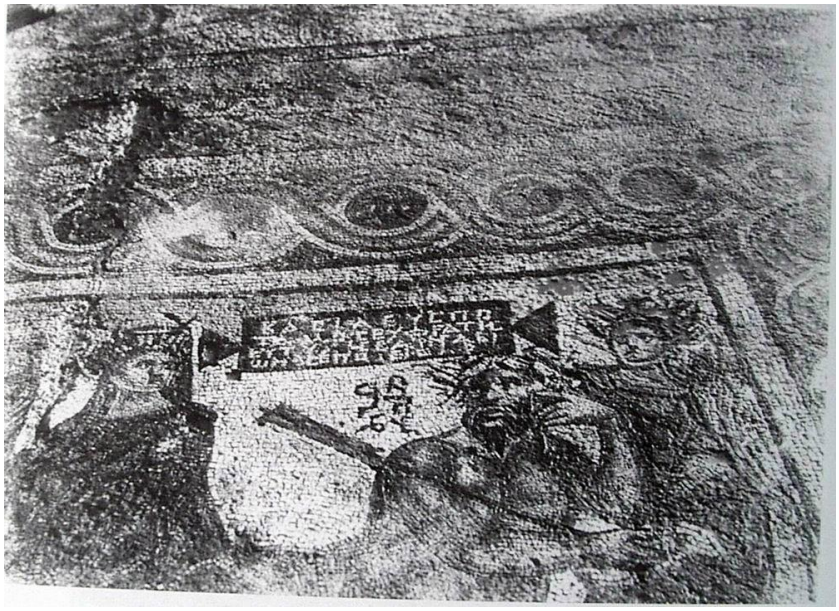


Figure 2.49 Mas'udiyah mosaic detail (Parlasca, 1983)

There are geometric motifs in the borders of mosaic. A variation of guilloche was used which is rare in Anatolia mosaics. Similar motifs are seen in Italy (Balmelle, et al., 1985).

Birtha and Its Mosaics

Birtha is the ancient name of the Birecik (Şanlıurfa) located in the southeast of Edessa close to Euphrates River. Two pieces of mosaics depict Heracles doing things. Salman (2007) indicates that those mosaics can be parts of 12 jobs of Heracles. Those mosaics are in Istanbul Archeological Museum. In the first one young Heracles was holding Nemea lion and trying to kill it. All that remains from lion was mane and claws. Background is in light colors and there are shades of the figures. Mosaic includes depth and perspective. Heracles was illustrated with a beard

in second mosaic while he was collecting apples from Hesperia trees. He wore his sword's scabbard.

Figure 2.50 Birtha Mosaics of Heracles doing things, Istanbul Archeological Museum (Salman, 2007)

Figure 2.51 Birtha Mosaics of Heracles doing things, Istanbul Archeological Museum (Salman, 2007)

Sarrin and Its Mosaics

Sarrin was remote province of Osrhoene, at southwest of Edessa, north of Mas'udiyeh, and beyond the Euphrates. Only a few is known about the historical development of the settlement. It existed in The Kingdom of Edessa period, and mythological mosaic unearthed here at 1983 and probably to be placed 6th Century AD. Nothing is known about the architectural context and function of the building it belonged. Middle panel is missing and four sides of a peristyle were decorated with six mythological scenes. Two longer panels show Artemis the huntress with her prey, amid hunting scenes, and the cortege of Dionysus with his thiasus. Four shorter panels contain Europa and the Bull; The Triumph of Marine Aphrodite; the rape of Auge by Heracles and Dido and Aeneas (probably); borders include scrolls with

hunters and Nilotic scenes (Dunbabin, 2012). The Triumph of Marine Aphrodite and Europa on the Bull are the subjects depicted in Zeugma mosaics as well.

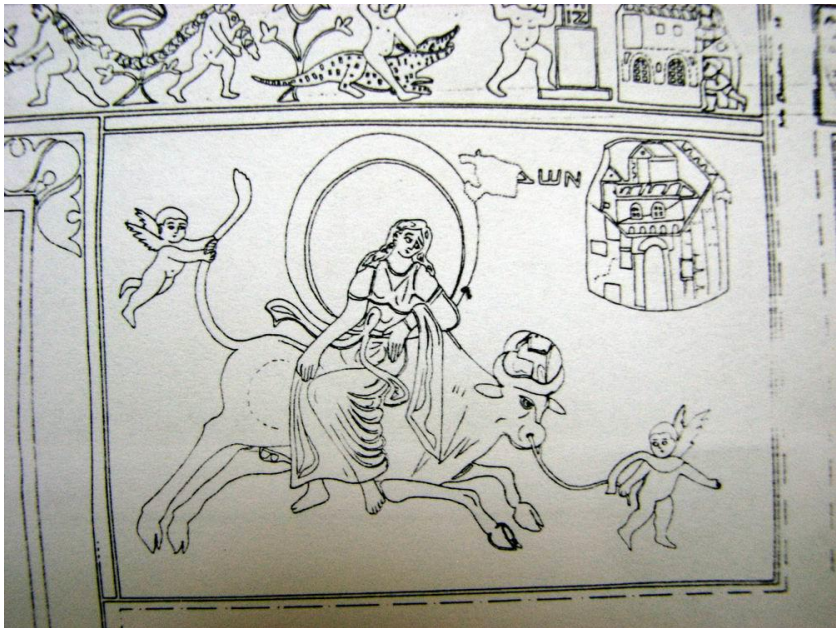


Figure 2.52 Europa on the Bull, Sarrin (Balty, 1989)

Figure 2.53 Europa on the Bull, Zeugma (from O. Dolaş's archive)

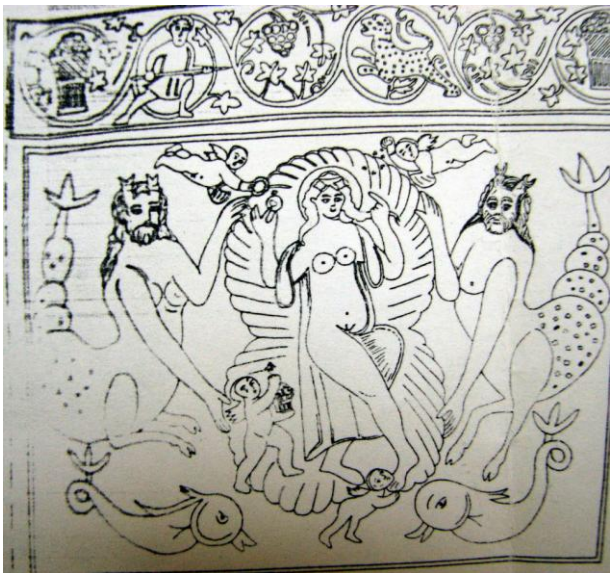


Figure 2.54 Triumph of Marine Aphrodite, Sarrin (Balty, 1990)

Figure 2.55 Triumph of Marine Aphrodite, Zeugma (Pinterest, 2015 https://www.pinterest.com/RIDEL23/goddess-aphrodite/)

2.4 Dionysus

This section includes brief information about Dionysus who is also known as Anatolian deity. He was chosen to limit the research on Zeugma mosaics, due to the fact the reiteration of the Dionysiac subjects. This will enable researches to compare and contrast mosaics from different regions for further researches. Section also contains East Mediterranean, Anatolia and Syria mosaics of Dionysus.

2.4.1 Early Life

Dionysus is the only Olympian deity with a mortal mother; Semele, who was in love with Zeus. Dionysus first came up in his mother's womb though later he stayed in his father's leg until he was born. According to the legend Semele, daughter of Kadmos, and Zeus were secret lovers. When Hera (wife of Zeus) found it out transformed into Semele's nanny and asked her whether she was sure or not that her lover is Zeus, because Semele had never seen his lover's face before. Semele was suspicious, and asked Zeus to show himself with his all divinity. Since, Zeus had sworn that he would do anything Semele asked, reluctantly he showed himself. Semele couldn't resist and started to burn with the flames of lightening and divine light of Zeus (Cömert, 2010). Zeus took the sixth month baby from Semele's womb and put it in his leg until he was ready to born. Therefore the baby deity was born two times. Zeus gave Dionysus to Hermes, who took the baby to Orkhomenos king Athamas and his wife Inno. However Hera was jealous again and drove king and the queen crazy. After that, Zeus sent the baby to Nyssa land to nymphs to take care of him (Aygüneş, 2006). This subject is depicted in the mosaics of Antioch, Nea Paphos and Sepphoris.

Dionysus spent his childhood out of sight in Nyssa Mountain around four nymphs. Nymphs named as Makris, Nyssa, Erato, Bromie took care of the baby deity at first who was transformed into a goat by Zeus in order to protect from Hera. Baby was nurtured with honey and milk. Dionysus learned to write poems from mousses and knowledge from Silenus. He grew up quite fast around satyrs, Silenus and nymphs, and at puberty he found out grape and how to use it. One day he was drinking nectar

and could not cause to cease his thirst, therefore he squeezed grapes and drank it. He put some more to the pot and decided to drink it later. However he went away and spent some time with forest elves and came three- four days later and found the drink. He noticed this was not grape juice anymore but something else which makes him feels better. He shared it with nymphs, elves and satyrs (Krugmann, 2003).

Figure 2.56 Baby Dionysus, Nea Paphos, 4th Century BC (Aygüneş, 2006)

Dionysus started to wander around the world with his cortege including Silenus, satyrs and maenads carrying the cult of wine with him. According to the legend one day Dionysus knocked Icarius' door and wanted to stay there. Icarius and his family hosted the deity for some days. When time to leave arrived Dionysus showed Icarius vineyard and taught him viniculture. He also said that, when the time comes he should squeeze grapes and keep them in a cellar till the drink was ready; then he could enjoy the drink and feel happy. Icarius was surprised and decided to do everything Dionysus suggested. When the wine was ready he tasted it and felt great. He offered the drink to his wife and daughter. They loved wine also. Still Icarius was not satisfied, so he wanted to share this recipe with villagers. When he gave them the drink, first people was suspicious but after tasting, they were relaxed and feeling happy. However when the amount of wine they drink ascended, villagers' behaviors have changed. They started to fight and beat each other and this ended with attacking

Icarius and killing him. When the villagers were sober again, they saw the dead body of Icarius; Dionysus punished Icarius for sharing his secret drink with people without his permission (Krugmann, 2003). There are examples of this subject in Nea Paphos (Cyprus), Oudna (Tunisia) and Vinon (France).

Figure 2.57 Favor of Dionysus, Nea Paphos 2nd- 3rd Century
(http://www.cyprushighlights.com/en/index.php/2010/09/11/new-paphos/, 2015)

Dionysus went to Thrace where was reigned by Lycurgus who hated grape and wine. He arrested Dionysus' cortege. Dionysus threw himself in water and sheltered to Rhea. However Dionysus revenged quite fast, Lycurgus went crazy and chopped his own son's legs and only until then he recovered from craziness (Cömert, 2010).

During his voyages one day Dionysus and his cortege went to Lydia, with all joy and festivity. Silenus felt asleep next to a fountain. In the morning villagers found him and took to the king Midas. The king recognized Silenus, hosted him well and some days after took him to Dionysus. Deity was really happy and gave Midas a favor. Midas wanted to change everything into gold and Dionysus enabled him. A while later Midas noticed what a big curse it was, the king was transforming everything in gold including food, drinks and even his son. He was overwhelmed with the grief and felt asleep where Dionysus showed himself in his dream and told Midas to go and clean himself in Paktalos stream. Midas went there with his gold son and got cured with his son getting back to life (Cömert, 2010).

In Nile delta with Amazon women, Dionysus battled against Titans and won which was his first military victory. His voyages spanned to India. Near Euphrates River he killed the king Damasks who created mutiny. Later he traveled in South East Anatolia and created a bridge on Euphrates or Tigris River made of ivy and vine. He had passed through the bridge on a tiger Zeus sent to him. Dionysus conquered the India where he taught viniculture and wine making to people (Graves, 2010). His sacred plants are vine and ivy; animals are lion, tiger, lynx, dolphin, bull and goat.

Dionysus always carried miracles with him, which made people both worship and get scared of him. In his voyages while going to Naxos Island in the ship, pirates wanted to sell people as slaves where Dionysus erected a vine in the middle of the ship and turned into a lion, pirates jumped into the sea and became dolphins (Graves, 2010). One of the important subjects in Dionysus' life is his relationship with Ariadne. In mythology, Theseus left Ariadne in Naxos Island, where Dionysus found her sleeping. He felt in love and took Ariadne with himself and married her. Dionysus and Ariadne were depicted together in many mosaics including Antioch and Zeugma mosaics (Cömert, 2010).

Figure 2.58 Dionysus and Ariadne, Zeugma 2nd -3rd Cent. (Aygüneş, 2006)

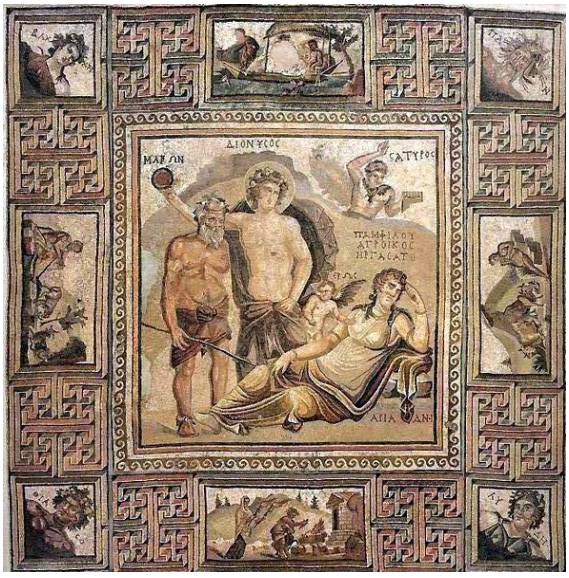


Figure 2.59 Dionysus and Ariadne, Antioch 2nd -3rd Cent. (Aygüneş, 2006)

In Thebes due to his corruption and pervert cults and festivities, king Pentheus captured Maenads and Dionysus. However Pentheus went crazy himself also so instead of Dionysus he captured a bull. Maenads drank wine and completely lost themselves. They tore apart everything they found including Pentheus. His own mother was with Maenads also. In his lifetime Dionysus could not get rid of Hera's jealousy. Even Hera made him crazy with wine, so the deity was unconscious and crazy in some part of his voyages. Later on, Dionysus was sent to Rhea by Zeus, to recover and regain his divinity along being pardon for the sins he committed during his craziness. In Phrygia lands Dionysus was purified from animal instincts, pleasures, craziness and weaknesses and was brought into the divine essence (Aygüneş, 2006).

2.4.2 Dionysus Cortege (Thiasus)

Figure 2.60 Satyr (Wikipedia, 2015)

Figure 2.61 Maenad (Wikipedia, 2015)

a) **Satyrs :** Satyrs are human-like horse tailed, goat hoofed, horned mythological creatures in the nature. They have oversized erected phallus. Most of the time these horny creatures chase Nymph and Maenads to make love

b) **Maenads :** Also referred as Bakkhas, Maenads are most mysterious member of the procession. Maenad word is an adjective derived from

Greek verb “mainomai”. Those women are in trance with the effect of the deity, blending in Dionysus and nature and look like crazy.

Figure 2.62 Silenus (https://flipsideflorida.wordpress.com/2013/07/29/masks-of-silenus/, 2015)

Figure 2.63 Pan (Wikipedia, 2015)

c) **Silenus :** In fact he is an old Satyr; Silenus is a close friend of Dionysus and his mentor. He is fat with an open forehead, with thick lips and flat nose and usually drunk wandering around.

d) **Pan** is the most entertaining member of the Dionysus procession. Pan is shaped half-goat, half-human, goat-footed, has a beard and horns. As one the fastest creature on earth, he jumps on the slope of the mountains with a crook and a flute called “syrinks”. Due to his weirdness he knew he was not welcome in Olympus, therefore he spent his time in Arcadia. He was a lazy creature and loved to lure nymphs. He is the only deity we witness his death (Graves, 2010).

2.4.3 Dionysus Descriptions in the Anatolian and Eastern Mediterranean Mosaic Art in the Roman Period

Dionysus cult has been mostly depicted in 6th Century BC especially in vase decorations. He was depicted along some other deities, satyrs, maenads and his beloved wife Ariadne. In the depictions until 5th Century BC the deity was illustrated with a chiton and himation. In early depictions he was brunette, long bearded and a middle aged man. In 430 BC he transformed into a young guy without beard, illustrated with boots and generally half naked. Therefore his young, feminine beauty was emphasized (Aygüneş, 2006). In Roman ages, the deity was depicted almost similar to Apollo with a feminine side. His head is adorned with crowns made of ivy, roses and fruits. He has curly hairs reaching his shoulders. His significant attribute is "cantharus" (drinking cup). He always has a crown made of ivy and vine and after Hellenistic period he also owns a diadem. Since 6th Century BC he carries a stick dressed with ivy and ribbons and has a pine cone at peak named as thyrsus.

Infancy

Figure 2.64 Baby Dionysus, Antioch 4th Century BC (Aygüneş, 2006)

In Anatolian and Eastern Mediterranean mosaic art in the Roman period baby Dionysus is depicted in three cities. Those are Antioch (Turkey), Nea Paphos (Cyprus) and

Sepphoris (Syria). In Antioch the mosaic is the floor mosaic of a bath house; in the other two, mosaics are the floor mosaics of triclinium of villas.

Nea Paphos has 11 figures and is the most crowded scenes compared to the other baby Dionysus mosaics. In the Antioch, mosaic is highly destroyed, therefore scene is not very clear. Hermes carries Dionysus to hand him to somebody most probably we do not see in the mosaic. In one side of the mosaic head of a nymph is still seen. In Nea Paphos mosaic baby deity is sitting on lap of Hermes. In Sepphoris mosaic, Hermes is not seen because this mosaic is depicting the baby Dionysus' first bath (Aygüneş, 2006).

In Sepphoris mosaic, baby Dionysus can't be seen clearly due to the damage. In Antioch and Neo Paphos mosaics there is a crown on Dionysus head and a halo around it. Baby deity is illustrated in a significantly lighter tone. He is bigger than a new born baby, has long hair and vivid eyes. Those exaggerations are due to his divinity nature. Both Nea Paphos and Sepphoris mosaics have the topic of "bath" as a part of his coming to Nyssa Mountain. There are differences in style and the objects of bath in both examples.

Childhood

Figure 2.65 Kid Dionysus, Bergama 2th Century AD (Aygüneş, 2006)

Figure 2.66 Kid Dionysus, Sepphoris 3th Century AD (Aygüneş, 2006)

Childhood of Dionysus is not depicted in many mosaics compared to other time periods of the deity, because his birth and the other achievements took more attention from artists. His infancy is illustrated on vases of archaic and classical periods. This continued in Roman Period also. In Anatolia and East Mediterranean mosaics only three mosaics depict childhood of Dionysus. Those mosaics are in Bergama (Turkey), Sepphoris and Nea Paphos. In those examples there are no similarity in subject, scene and style. However there are significant similarities in iconographic language and figure repertory between infancy drunkenness, drinking contest and India victory of Dionysus (Aygüneş, 2006).

In Bergama mosaic kid Dionysus is illustrated sitting on Silenus' lap (Picture 9). In Sepphoris example Dionysus is depicted on back of a goat. The last example belong to Dionysus childhood is Nea Paphos example which was found in Aion House triclinium and belongs to 4th Century. Dionysus is illustrated on a car pulled by centaurs which reminds his India victory scenes. In Bergama mosaic, Dionysus is depicted excited staring at the cup Silenus holding. His skin was illustrated in lighter tone compared to Silenus. Sepphoris mosaic is the only mosaic where Dionysus is illustrated on a tamed animal like a goat, in rest of the European and African mosaics deity is depicted on a wild animal such as lion, tiger or leopard. Dionysus is naked but carrying a crown. One of the nymphs is carrying thyrsus.

Figure 2.67 Kid Dionysus, Nea Paphos 4th Century AD (Aygüneş, 2006)

Last scene is from Nea Paphos and belongs to 4th Century. The subject is similar to the triumph of Dionysus after he conquered India though, Dionysus was a young deity when he was in India and never depicted as kid in those triumphs.

Mosaic is destroyed though there are maenads, centaurs, Tropheus and Skyrtos along Dionysus. A similar scene is found in El Jem (Tunisia). But this time Dionysus is on a lion and it looks like a regular passage of Dionysus procession instead of a triumph. In this mosaic the part where Dionysus is, was completely destroyed.

Figure 2.68 Kid Dionysus, El Jem 2th Century AD (Aygüneş, 2006)

Drunken Dionysus

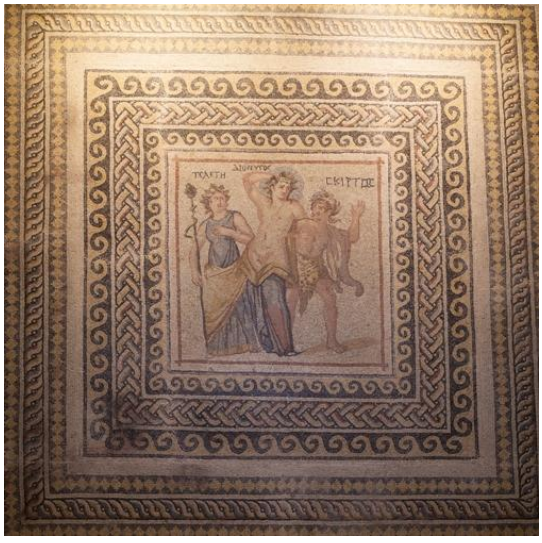


Figure 2.69 Drunken Dionysus, Zeugma 2nd Century (Y. Tanrıverdi, 2015)

Figure 2.70 Drunken Dionysus, Antioch 1st -2nd Century (Hatay Müzesi Web, 2015)

There are two mosaics depicting this subject. One is in Antioch and the other is in Zeugma. In both compositions number of figures is three. Dionysus is in the center to take attention. In zeugma example, his halo is blue in a contrast with the background which takes attention and then leads it to the his face. He is wearing a crown as usual. He is half naked and his skin is lighter than satyr in both examples. Zeugma sample is more colorful than Antioch one. The border motifs are richer and more complex in Zeugma scene. The shades of the figures are important for the mosaic also. This color change shows where the light source is.

Drinking Contest of Dionysus and Heracles

This topic hasn't been commonly illustrated in Roman mosaic art and only three examples depict this scene. Two are in Antioch and one is from Sepphoris. All examples are from triclinium of the villas. In all examples Dionysus' skin is illustrated in a lighter tone compared to other men especially Heracles. Heracles has dark skin which symbolizes his brutal force. Dionysus is feminine, gentle and the winner of the contest. Antioch mosaics are finer compared to the Sepphoris one. Former one used light, shade and depth to strength the effect of the mosaic.

Figure 2.71 Drinking Contest of Dionysus and Heracles, Antioch 2nd Century (Aygüneş, 2006)

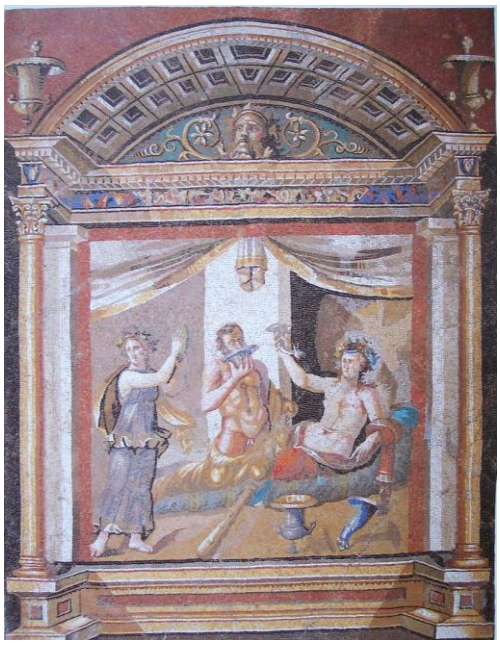


Figure 2.72 Drinking Contest of Dionysus and Heracles, Antioch 3rd Century (Aygüneş, 2006)

The dynamic effect of the light highlights the mosaic partially. Dionysus is in the darker part which emphasizes his divine brightness and lighter skin. His face is pointed at light; in contrast Heracles' face is turned at dark side which shows the winner of the contest.

Figure 2.73 Drinking Contest of Dionysus and Heracles, Sepphoris 3rd Century (Aygüneş, 2006)

Dionysus' Favor

Figure 2.74 Favor of Dionysus, Nea Paphos 2nd – 3rd Century (http://www.cyprushighlights.com/en/index.php/2010 /09/11/new-paphos/)

This subject is illustrated only in Nea Paphos in Anatolia and East Mediterranean mosaics. There are examples in Oudna (Tunisia) and Vinon (France) also. The style of the mosaic is significantly similar to the Antioch examples. Shades of the figures are seen next to them. Dionysus is again illustrated in a lighter skin compared to others. Good effect of wine is seen on the female figure's face, she is staring at the light. However villagers show the bad side of drinking, their face are turned towards darkness. Icarius is depicted in the middle, when we compare Nea Paphos and Tunisia mosaic, Icarius is completely different. In Nea Paphos example he is barefoot, in Tunisia mosaic he is dressed like a king.

Figure 2.75 Favor of Dionysus, Uthina (Tunisia) 2nd Century (Aygüneş, 2006)

The Triumph of Dionysus

Figure 2.76 Triumph of Dionysus, Antioch (Aygüneş, 2006)

Figure 2.77 Triumph of Dionysus Zeugma 2nd Cent. (from O. Dolaş's archive)

This scene is a popular subject in Roman mosaics. Classification is due to the animals pulling the chariot. In some mosaics, tigers or lions pull Dionysus' chariot, in some centaurs and in some examples the car was being pulled by elephants or exotic animals. When the mosaics are investigated, Antioch and Gerasa mosaics are highly damaged and most of the figures are missing. Nea Paphos and Zeugma examples are in good condition and all figures are in good condition. Both compositions are colorful and detailed. In classification color is not mentioned as a variable though, color map and size and shape of tesserae would ease to classify these kinds of cross cultural depicted scenes.

Figure 2.78 Triumph of Dionysus, Nea Paphos 2nd- 3rd Century (http://ancientrome.ru/)

Figure 2.79 Triumph of Dionysus, Nea Paphos 2nd- 3rd Century (http://ancientrome.ru/)

Figure 2.80 Triumph of Dionysus, Nea Paphos 2nd- 3rd Century (http://ancientrome.ru/)

Figure 2.81 Triumph of Dionysus, Sousse 3rd Century (Aygüneş, 2006)

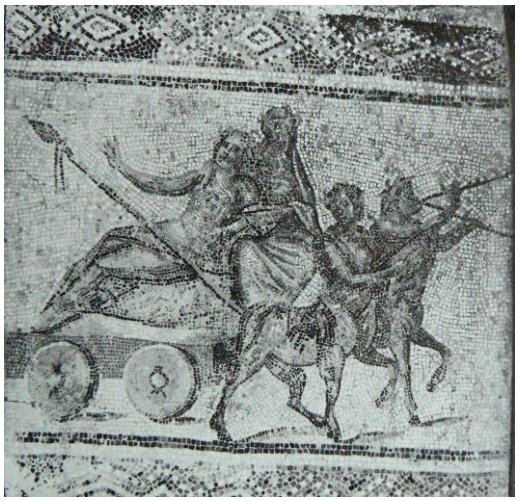


Figure 2.82 Triumph of Dionysus, Gerasa 2nd Century (Aygüneş,2006)

Figure 2.83 Triumph of Dionysus Sepphoris 3rd Century (Aygüneş, 2006)

Dionysus and Ariadne

Dionysus and Ariadne are popular one among Roman mosaics though there is no unity between topics, compositions, location, and figures of Anatolia and East Mediterranean mosaics. Different geographies employed different style and depiction. Main topics are when Dionysus met Ariadne in Naxos Island, their wedding and the godlike couple together. Most crowded scenes are the mosaics depicting wedding.

Figure 2.84 Dionysus and Ariadne, Antioch 2nd Century (Aygüneş, 2006)

In Antioch example, perspective is used so viewer can differentiate the depth, shades and tones of colors were used professionally. Zeugma example illustrates their wedding, is rich in colors and tesserae size is significantly small[7]. The mosaic from Ephesus is highly damaged and illustrates the couple alone.

Figure 2.85 Dionysus and Ariadne, Syria 2nd- 3rd Century (Aygüneş, 2006)

Figure 2.86 Dionysus and Ariadne, Zeugma 2nd- 3rd Century (Aygüneş, 2006)

[7] Two pieces of The Wedding Ceremony of Ariadne-Dionysus, from Zeugma were stolen during its exhibition at the site in June of 1998. Since lost parts contain Dionysus also, this mosaic was excluded from the study.

Figure 2.87 Dionysus and Ariadne, Zeugma 2nd- 3rd Century (Aygüneş, 2006)

Figure 2.88 Dionysus and Ariadne Ephesus 5th Century (Aygüneş, 2006)

Figure 2.89 Dionysus and Ariadne, Shahba 4th Century (Aygüneş, 2006)

Shahba example illustrates the wedding though, compared to Zeugma mosaic, colors and style is weaker. Sepphoris mosaic is the weakest one among color and workmanship. Style of composition and figures are completely different and mosaic seems to be two dimensional. There is no feel of depth.

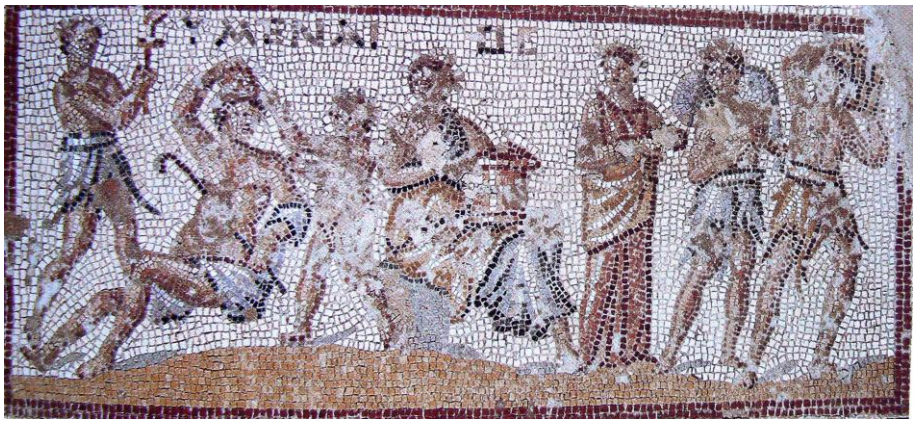


Figure 2.90 Dionysus and Ariadne, Sepphoris 3rd Century (Aygüneş, 2006)

Dionysus's Cortege

Figure 2.91 Dionysus's Cortege, 2nd Century Antioch
(www.hatayarkeolojimuzesi.gov.tr)

This mosaic is similar to the Drunken Dionysus one in Antioch. However studies claim that the way Maenad dresses shows that this should be his procession's passage (Levi, 1947; Campbell, 1988).

The scene is surrounded with borders including waves, stepped triangles and guilloche. Background is white and no shades are included to give the direction of light. Colors are blue, yellow, burgundy and beige to illustrate skins. However the use of tones of colors enabled the artist to give the feeling of fabric in clothing. Borders are in black and burgundy.

Dionysus's Busts

Figure 2.92 Dionysus's Bust 4th Cent. AD Apamea (Aygüneş, 2006)

Figure 2.93 Dionysus Bust Antioch (Aygüneş, 2006)

Figure 2.94 Dionysus's Bust 2nd- 3rd Cent. AD Zeugma (from O. Dolaş's archive)

Figure 2.95 Dionysus's Bust 2nd- 3rd Cent. AD Zeugma (from O. Dolaş's archive)

Dionysus is also illustrated alone as busts. In archaic period deity was illustrated as a middle aged man with beard though in Roman period he is feminine, lighter in skin, with long hair and young body (Levi, 1947; Campbell, 1988). He always wears a crown made of ivy, vine and fruits. He also has a diadem. In Anatolia and east Mediterranean busts are seen in Antioch, Zeugma and Apamea (Syria).

CHAPTER 3

MATERIAL AND METHOD

In this Chapter, the details of the material and methodology are presented. The first section covers descriptions and selection criteria of the subject material. The second section instructs the methodology and operational procedure that is used for evaluating artifacts.

3.1. Material

Mosaics in Commagene Region, Middle Euphrates are investigated in this study (Figure 3.1). Material constitutes the mosaics from Adıyaman and Zeugma Mosaic Museums. Adıyaman Museum includes mosaics from Samosata, Arsemeia, Perrhe and Bahasna. Zeugma Mosaic Museum preserves and exhibits Belkıs-Zeugma mosaics. Tesserae samples from Perrhe obtained from Adıyaman Museum were investigated for detailed analyses in the study (Figure 3.6). Color study for Adıyaman mosaics were conducted on both mosaics and sample tesserae. Konica Minolta Chroma meter CR-400 and Munsell Soil Chart were used to detect and present color mapping of selected mosaics (Figures 3.4 and 3.5).

Mosaics from Adıyaman Museum were photographed with Canon Eos 450D. 1 Sigma 70300 and Canon 18-55 EF5 lenses were used while photographing tesserae samples and mosaics. For Zeugma mosaics, Canon Eos 5D Mark II and Canon EF 24-105 lens were chosen, because mosaics were in exhibition hall, lighting was dramatic and distance to mosaics were longer. Additional led lighting was used to eliminate the low cast conditions. Trip notes were taken in both museum visits into the catalogs prepared before. Catalog was adopted from literature (Erdinç, 2002; Parish, 2007; Salman, 2007; Şen, 2009, Figure 3.2).

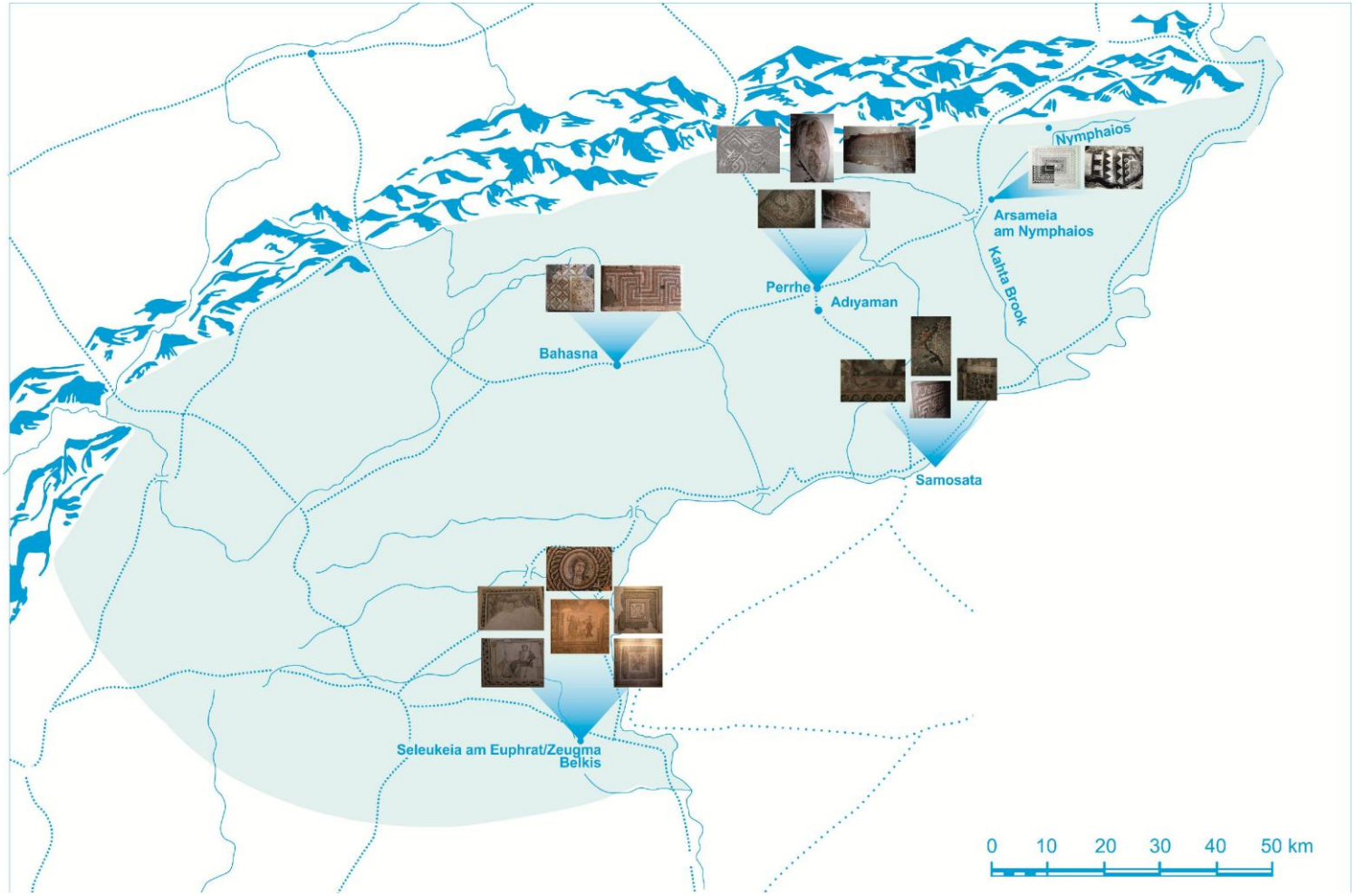


Figure 3.1 Commagene map with mosaics used in the study

Name of the Mosaic:	
Corpus Number:	
Origin of the mosaic or the Archeological Settlement it comes from:	
Function of the Space:	
Date of Excavation:	
Period of the Mosaic:	
Current location and Protection Status of the Mosaic:	
Size of the mosaic (in meters):	
Technique of the Mosaic:	
Tesserae Type:	
Tesserae Size:	
Tesserae Shape:	
Tesserae colors :	
Density	
Mosaic Patterns and descriptions	
Comment/Explanations	
Bibliography	
Drawings/ Photos	

Figure 3.2 Catalog suggested for identification of mosaics

Catalog consists of main headlines to identify and record each mosaic properly during site trips. All mosaics were recorded in order to collect related information correctly without missing any data. For unknown parts, literature review or museum authorities were investigated. Headlines in catalog refer as follows:

- Name of the Mosaic: If mosaic was named by authorities this name was used. If not a reminder was put in order to prevent complications.
- Corpus Number: This number refers to which number the mosaic takes along the other mosaics used in this study.
- Origin of the mosaic or the Archeological Settlement it comes from: Identifies where the mosaic was excavated from, such as sacrificial building, palace or villa.
- Function of the Space is also recorded to evaluate the mosaic properly, including the purpose of the space it was taken from. Tablinium, peristyle, palace hall or corridor etc.
- Date of excavation was generally obtained from literature.
- Period of mosaic was important to consider the differences in colors and tesserae traits depending on era. Comparing two mosaics from different periods may create confusion and mistakes for color palette and tesserae dimensions. Still if there was only one mosaic from a period, it was not neglected and studied.
- Current location and Protection Status of the Mosaic: Some mosaics are being exhibited in situ, some are in museum exhibitions and some has to be kept in museum archives due to the lack of space to exhibit the mosaics. Keeping conditions affect protection status of the mosaic and makes recording harder.
- Size of the Mosaic: In some mosaics, dimensions were stated in the identification panels in exhibition halls such as the ones in Zeugma Museum. If this information was missing, sources from literature was used.
- Technique of the Mosaic is about how the artists laid tesserae pieces like opus tessellatum, opus vermiculatum etc.
- In Tesserae type, pebble or cut stone; and stone type were recorded.

- Tesserae size was recorded approximately for borders and figural scenes. For figural scenes highest and lowest and in-between values were taken into consideration.
- Tesserae shapes were observed morphologically during the analysis done in site and sketched during observation. Detailed shape analysis was later conducted in computer after tesserae in selected part were drawn.
- Tesserae color was a base headline for keeping the raw data correctly. Here the hue in mosaic was recorded with the number of measurement done by Konica Minolta Chroma meter. When there were same hue in different places it was noted as "yellow in border" or "yellow in Dionysus' himation" and the measurement numbers of each hue was added next to them in order to prevent mistakes.
- Density of the mosaic is tesserae number in per dm^2. In literature generally density of the mosaics are stated if not it was measured in site.
- Mosaic patterns and descriptions were recorded to indicate the most reiterated patterns in mosaics studied. This information may be helpful for further studies where the borders are taken into consideration.
- Comments/Explanations: this part was used to define anything important, missing and/or different about mosaic observed in site.
- Bibliography includes the sources from literature related to mosaic which are used in this study.
- Drawings/Photos part has drawings and sketches done in site research, reconstruction drawings when needed and photographs when it is useful.

For preliminary study mosaic examples from Adıyaman Museum was selected. Mosaic with Fishes was in exhibition hall, in good condition to investigate and rest of the mosaics from Commagene Region was preserved in museum archive. Color detection and tesserae study were conducted on a part from center of Mosaic with Fishes and border of Perrhe Mosaic 2. Mosaic with Fishes was a good start point to classify tesserae shapes because this mosaic was excavated from Samosata Palace and palace mosaics show great mastery and exquisite workmanship which might reflect the tendencies and styles of the period. Reason for selecting a border from Perrhe was; border of Mosaic with Fishes contained only two color chips. There was

also another mosaic depicting the deity Dionysus in Adıyaman Museum's exhibition hall though the debate about the originality of the mosaic was considered as a bias, therefore mosaic was unlisted in the study. Investigations on Mosaic with Fishes and Perrhe mosaic were used to upgrade the catalog suggested for the identification of mosaics and method employed in the study.

Figure 3.3 Mosaic with Fishes, Adıyaman Museum (Salman, 2007)

Mosaic was photographed with Canon Eos 450D. Colors were detected with Konica Minolta Chroma meter CR-400 and Munsell Soil Color Chart. Munsell Color Values are recorded. These values include three different variables which are H for hue, V for value and C for chroma. Results were recorded and mosaic was redrawn in computer using CorelDraw Graphics Suite X7. Material of this study is presented below.

Figure 3.4 Konica Minolta Chroma meter CR-400 (http://www.qualitydigest.com/inside/metrology-news/how-measure-color-differences.html, 2015)

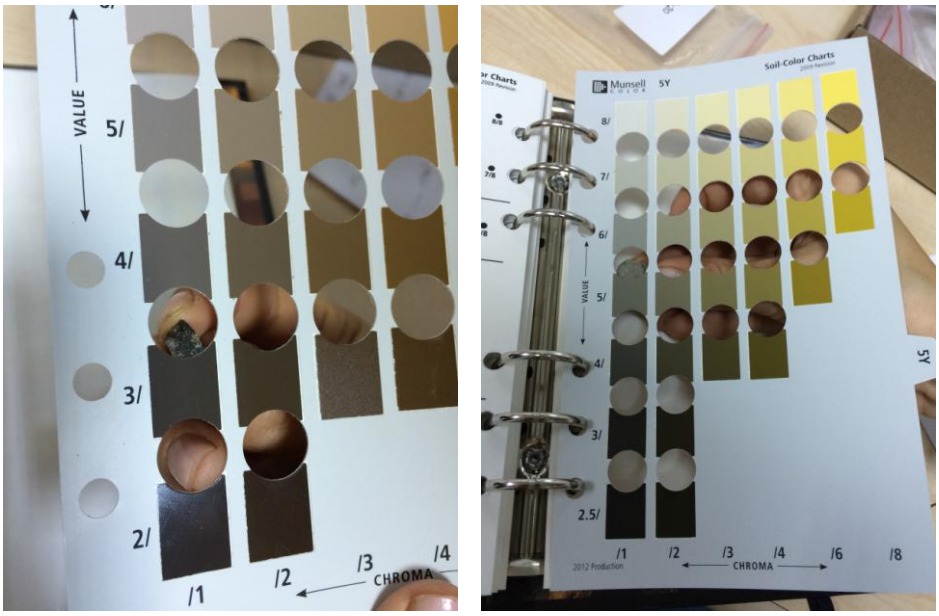


Figure 3.5 Munsell Color Chart (Y. Tanrıverdi, 2015)

Color study was conducted on selected areas of the mosaics and recorded. Konica Minolta Chroma meter CR-400 has options to change color space. To create most reliable color chips Lab Color Space was recorded during investigations along Munsell color space values. Both mosaics contained few colors therefore all colors were detected including both the figures and backgrounds. However in some mosaics

such as Zeugma collection artists used tints and shades of a color to create a realistic effect. In these mosaics it was not possible to detect all colors instead original hue and prevalent tints or shades are recorded. In addition, Konica Minolta Chroma meter CR-400's camera is at the bottom and it is hard to see where it targeted. Therefore mortar values or some other tesserae close to the selected one were recorded accidentally. In these situations either the detection was reiterated or if the color is not relevant with the tesserae a similar chip was prepared in computer and added with RGB (red, green, blue) values.

To explore the tesserae traits, selected parts of the mosaics were photographed in detail, investigated and tesserae shapes were drawn in computer. In site researches a scale was added to the photographs. Taken photographs were transferred to the computer and drawn with Wacom Intuos Tablet in CorelDraw Graphics Suite X7.

Figure 3.6 Perrhe samples (Y. Tanrıverdi, 2015)

Tesserae samples from Adıyaman museum, selected according to the colors used. Two tesserae of each color were selected; their colors were recorded, photographed

and saved. Then six of the samples were selected according to their colors, sent and subjected to XRD analysis which is abbreviation of X-ray diffraction. The atomic planes of a crystal cause an incident beam of X-rays to interfere with one another as they leave the crystal and this phenomenon is called X-ray diffraction. XRD is used for to measure the average spacing between layers or rows of atoms, to determine the orientation of a single crystal or grain, to find the crystal structure of an unknown material and to measure the size, shape and internal stress of small crystalline regions (XRD Lectures, 2015). An example sheet of samples is presented below as labeled with ST01, ST02 etc (Figure 3.7). During the study those samples were investigated for their color values and later presented in the color catalog of Perrhe.

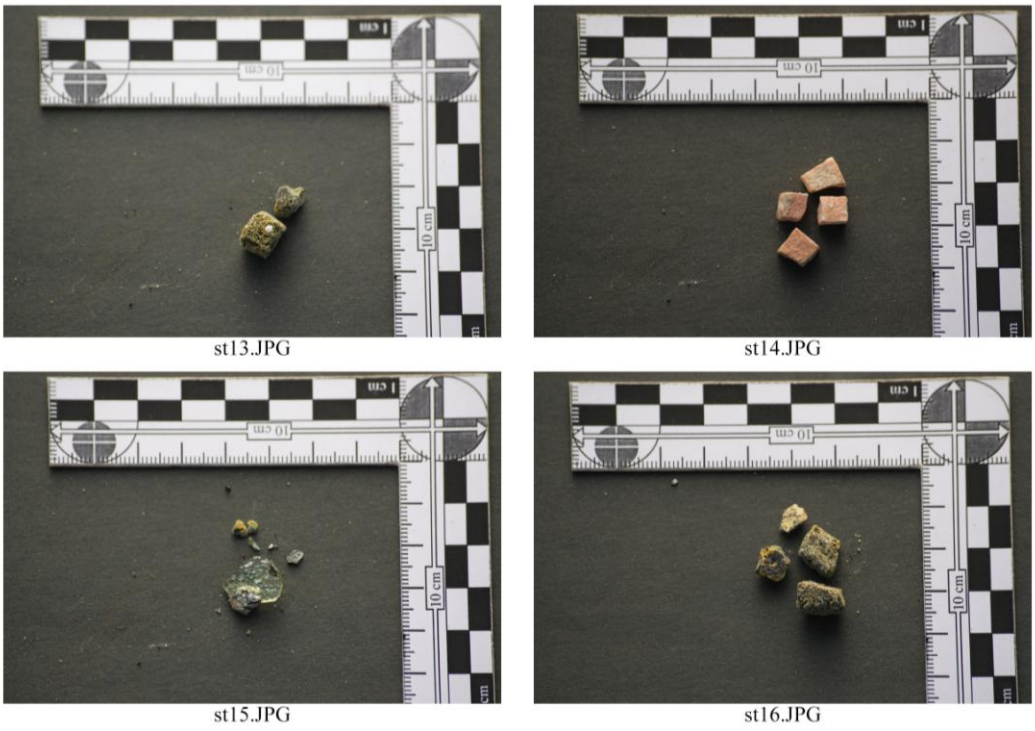


Figure 3.7 Examples from Perrhe samples (Y. Tanrıverdi, 2015)

3.2. Method

Samples from Adıyaman Museum were studied initially following literature review. A report has been drawn up and samples mostly including examples from Perrhe

excavations were investigated. Samples were in same bag and contaminated with soil and other stuff. There were individual tesserae samples and also some mosaic pieces in the bag. Colors were not clear until they were cleaned. They were washed with mild soap and water and for some pieces soft toothbrushes were used. For drying samples were laid on a surface for 3-4 days, later they were put in the drying oven in 50^{o}C for 12 hours.

Later all subject material were investigated and tesserae with distinguished colors were recorded as samples. From each color two or three available tesserae were taken in order to record them properly. They were put in small plastic bags and labeled as ST1, ST2 etc (Sample Tesserae 1, Sample Tesserae 2 etc.). In some tesserae corrosion was high and there were color changes. In ST15 center of the tesserae was different than its surface (Figure 3.7). To analyze them accurately, all samples' surfaces were cleaned with a scalpel. In addition to selected tesserae, some mosaic pieces were analyzed and recorded. Selection criteria were to choose the ones with different colors.

All selected tesserae and mosaic pieces were photographed under bright sunlight with a scale next to them. A black background was used. Instruments included a tripod and a high resolution camera (Canon Eos 450D) as well. Collected data were transferred into Photoshop to prepare sample sheets. When all samples were recorded, tesserae colors were measured with Konica Minolta Colorimeter. Obtained Munsell space values were noted and a color chip was found from Munsell Soil Color Chart for each tessera (Figure 3.5). Reliable results were kept and mistakes were corrected with appropriate values afterwards. ST15 and ST32 could not been recorded properly because, ST15 was transparent and ST32 was small to be captured by the camera of Konika Minolta Chroma meter. Munsell and Lab Color values for each tessera were added to the sample sheets prepared. With Lab Color values a rectangular color chip was prepared in Photoshop and added next to the each sample. At last step of this part, six tesserae with common colors were selected and sent to XRD analysis to be used in this study. Rest was also recorded with mortar samples to be analyzed as a part of a scientific research project suggested about mosaics of Adıyaman region and their properties at the beginning of the term for budget concerns and it was supported by the institution (Adıyaman Çevresindeki Antik

Mozaik Eserlerin Materyal Özelliklerinin Saptanarak Günümüz Üretim Koşullarında Yeniden Üretimi, 2014).

A particular detail from investigation was; some of the mosaic pieces were lighter compared to others. Those pieces had thinner mortars, and also small tesserae with significantly small depths. This may be related to where the mosaic was applied to; if it was on ground the mortar should be thicker, if it was applied on wall, both the stones picked and mortar should be lighter. At the same time, this may be associated with indication of mastery. Artists proposed functional solutions along creating aesthetical finishing materials (Figure 3.8).

Figure 3.8 Two different mosaic pieces from Perrhe (Y. Tanrıverdi, 2015)

Initially following investigation of samples, a preliminary research is conducted in Adıyaman Museum. Mosaic with Fishes' and Perrhe mosaic's color and tesserae traits were studied. As mentioned in material part, Konika Minolta Chroma meter and Munsell Soil Color chart were main instruments. Following calibration of chroma meter all distinguished colors of mosaics were recorded and noted down. It was possible to detect all colors used in these mosaics however in mosaics with more colors only a region was selected and investigated such as Dionysus head and around in Zeugma mosaics. In preliminary research hue was recorded and in addition its three tints and shades measured in digital media were added to results (Figure 3.9). However in real research this was meaningless considering Zeugma mosaics contain

sometimes up to ten tints or shades of the same hue. Raw data were analyzed in computer using CorelDraw Graphics Suite X7. Tesserae of the mosaics were redrawn with Wacom Intuos Tablet to classify tesserae shapes (Figure 3.11). Color chips were prepared in CorelDraw regarding the Munsell values recorded during museum trip. Investigation on tesserae traits, color measurements and its distributions are briefly explained below.

Two detail photos from Mosaic with Fishes and Perrhe Mosaic were selected. Color chips were prepared in CorelDraw from recorded Munsell values during trip and additional ones were added using eyedropper tool of the software from different tesserae of same hue. Those chips were to indicate tints and shades of recorded hues of mosaic (Figure 3.9). Chips created from recorded values were presented on the left with H, V and C values written next to it, other chips belonged to tints and shades of selected hue.

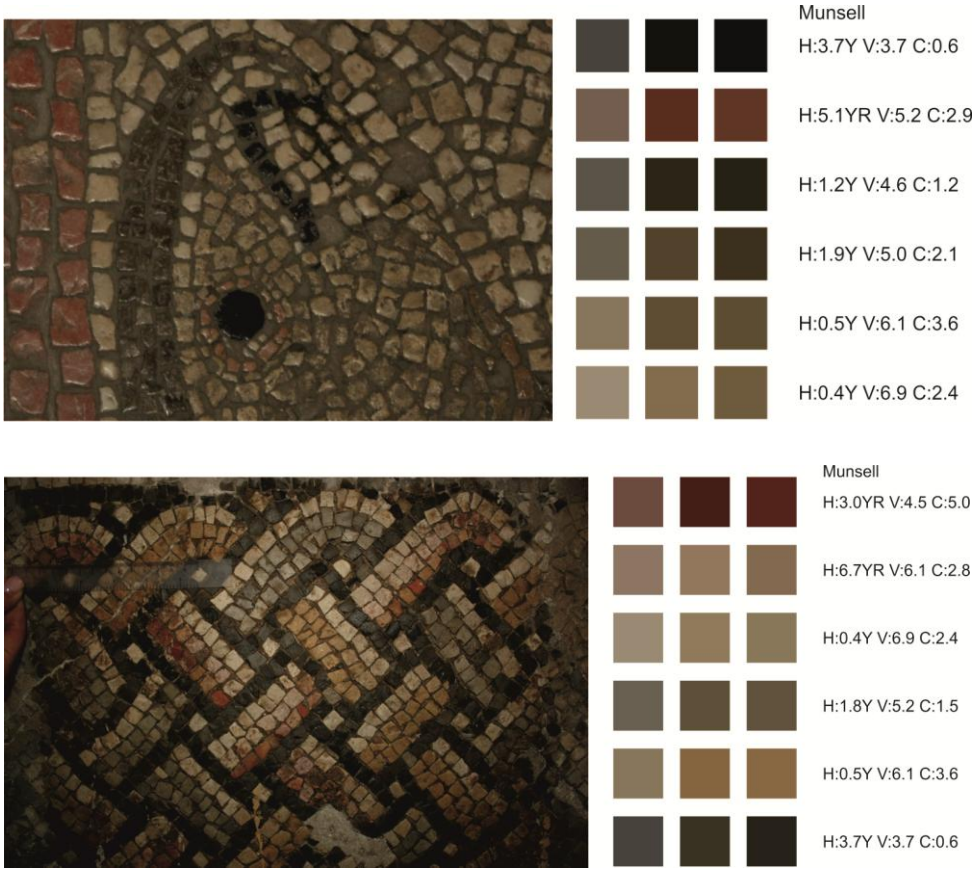


Figure 3.9 Color schemes with Munsell Color Lab values

Presenting Munsell values along tints and shades measured in CorelDraw was avoided in main study. First of all, computer measurements were not as reliable as Konika Minolta Chroma meter values, and another substantial point was corrosion of tesserae which might result with color changes. It should also be considered, tesserae were obtained from natural stones mostly, and different parts of same source might look different. Artists took advantage of this natural fact by using tints and shades of same hue to create realistic effect in mosaic as an indication of mastery. Therefore, in main study all tints and shades were accepted as one hue and only measured values were presented (Figure 3.10).

Figure 3.10 Detail from Acratos and Euphrosyne, Zeugma; use of tints and shades (from O. Dolaş's archive)

Tesserae shapes of Mosaic with Fishes were drawn in CorelDraw using Wacom Intuos graphic tablet (Figure 3.11). Some of the tesserae shape in figurative part of the mosaic were unclear due to the mortar mistakes, and if tesserae were broken or partially damaged. In preliminary study, those tesserae were drawn but had not been taken into consideration when classification groups were constituted because those tesserae were not cut intentionally to obtain these shapes as part of design.

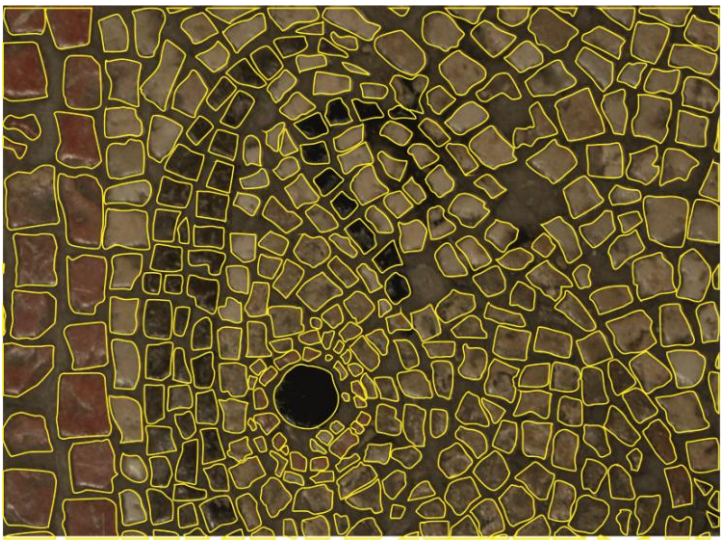


Figure 3.11 Drawing shapes of tesserae

Drawings of tesserae contain information related to shape, size and order of the tesserae. In actual study main shapes neglecting broken parts were considered as classified groups of tesserae. If broken or deteriorated parts of the tesserae made it impossible to perceive actual shape, they classified along amorphous tesserae found in the mosaic. Details from figurative parts contained smaller tesserae including ragged stone pieces compared to borders (Figures 3.12, 3.13).

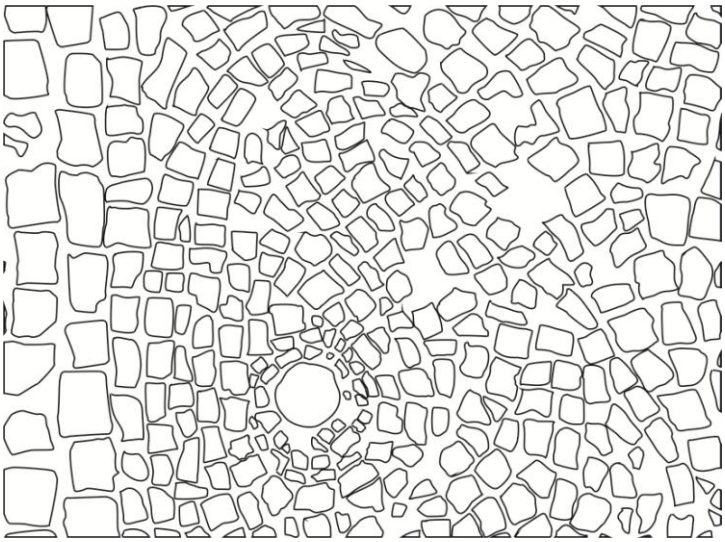


Figure 3.12 Drawn tesserae shapes of figurative part

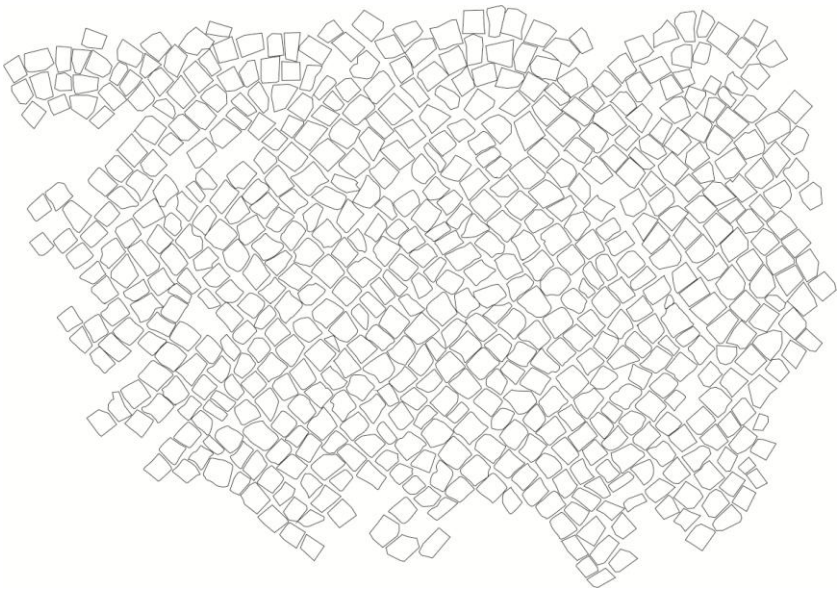


Figure 3.13 Drawn tesserae shapes of border

Tesserae shapes were indicated by coloring all drawn tesserae in white and presenting on a grey background. It should be noted technique employed was related to tesserae shapes as observed in preliminary study. When the technique was opus tessellatum, use of squares and rectangles was high. Other shapes were preferred when opus vermiculatum was the technique; such as trapezoids or parallelograms forming guilloche motif more accurate than squares (Figure 3.15).

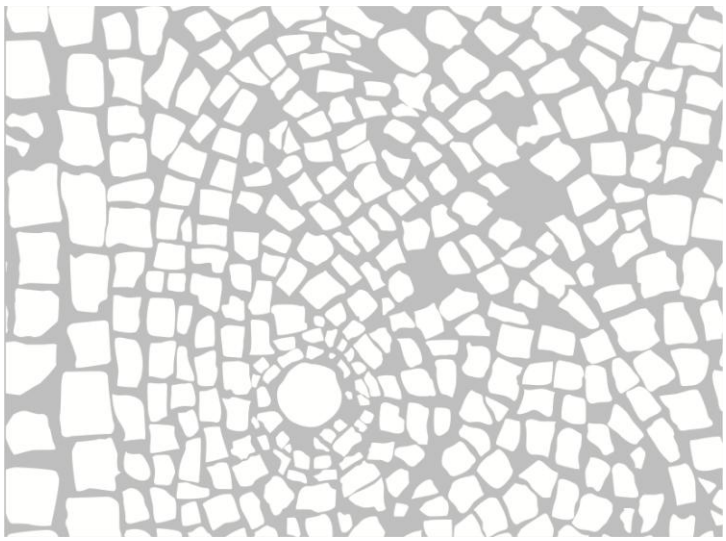


Figure 3.14 Tesserae shapes of figural part

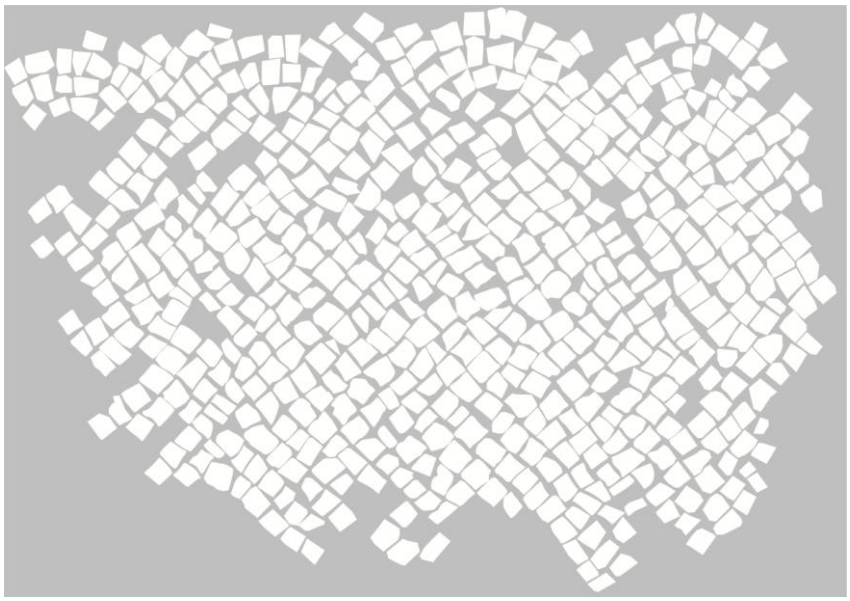


Figure 3.15 Tesserae shapes of border

Square and rectangle were the main shapes to form the background and borders mostly. Other shapes intentionally used in the mosaic were trapezoids, parallelograms and triangles. In Mosaic with Fishes there were also roundel shapes to form eyes of the fishes. Roundel tesserae are uncommon for mosaics because it is hard to form and should be used for specific delineations such as eyeball.

Figure 3.16 Mosaic color distribution

In next step, drawn tesserae of Mosaic with Fishes were classified according to its colors. All tesserae belonged to one hue were selected and grouped to create one object from it. Then this object was selected and colored with chip obtained from measured Munsell values. In the end there were groups of tesserae from each hue detected. When all tesserae were colored from selected area, tesserae lines were deleted and colored shapes showing color distribution were obtained (Figure 3.16, 3.17). For unmeasured tesserae color groups, color chips with RGB values prepared in CorelDraw and used.

Figure 3.17 Mosaic color distribution

At the end of the preliminary study, common tesserae shapes were recorded. Other mosaic examples from Commagene Region were investigated as well to check the validity of classification. According to most reiterated shapes, samples were grouped into seven classes. First group included square tesserae and shapes close to square. Second group collected rectangles which are commonly seen in mosaic samples. Third and fourth groups contained trapezoids and parallelograms and shapes similar to them respectively. Fifth group had less tesserae compared to other groups, still the shape should not be neglected since it was cut intentionally which were triangles. Sixth group was amorphous shapes and contained irregular and altered tesserae. Last

classification was definitive piece included roundel tesserae used for specific delineations such as eyeball.

Figure 3.18 Shape classes of tesserae

Following preliminary study, shortcomings of it were recorded and method was redesigned for the main study. To analyze tesserae size it was decided to use a scale while capturing mosaics. When the photographs were transferred into computer 1 cm of scale was equalized to 1 cm of software. Then biggest and smallest tesserae from each classified group was measured and presented in catalogs of mosaics.

In main study initially mosaic catalogs were printed and copied to record any Commagene region mosaic possible from Adıyaman Museum. All attainable mosaics from Adıyaman Museum were investigated. Those mosaics included examples from Samosata, Bahasna and Perrhe. Arsemeia mosaics are only known from literature; however they are also added to the catalog to mention the motifs and any information related to color and tesserae traits. Later, Zeugma mosaics were studied in Zeugma Mosaic museum and recorded.

CHAPTER 4

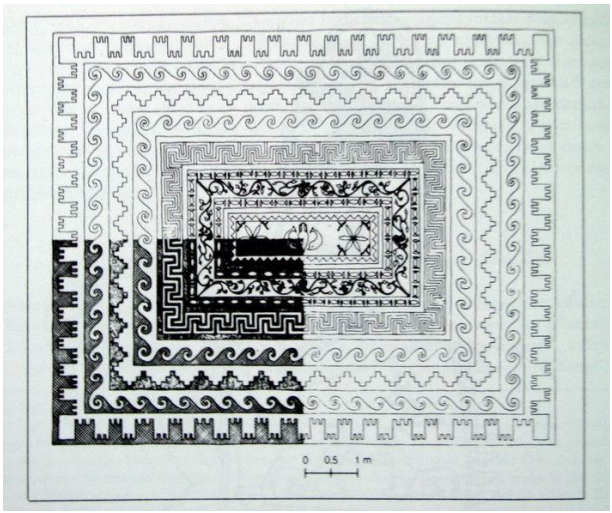
RESULTS AND DISCUSSION

This study tries to propose an archeometric quantified morphological and mineralogical approach regardless of style on tesserae of ancient mosaics from Commagene Region namely Arsameia, Samosata, Bahasna, Perrhe and Zeugma in Southeast Anatolia, Turkey. Thus, the aim whilst data collecting was to set a standard in mosaic classification in order to ease interdisciplinary studies may be conducted on subject area. Firstly, the information catalog contains, is evaluated between different regions to point out the similarities and differences among settlements. Then subject matter of this study, color atlas for Commagene Region, Southeast Anatolia Mosaics is provided. Thirdly, comparisons and evaluation of tesserae shapes and sizes measured throughout thesis is presented. Last part of the chapter includes the XRD results of Perrhe samples along their color values in Munsell and Lab Color Spaces.

Data collected reveals, information for Arsameia mosaics is only available in literature. Two mosaics are found in the survey named as Arsameia Mosaic 1 and Arsameia Mosaic 2, which are both Late Hellenistic Period mosaics incongruent with other Late Hellenistic mosaic examples with significant border compositions. Turreted wall is only seen in Arsameia Hellenistic mosaics in southeast though; Delos and Pergamon also gave example of this motif. Arsameia and Samosata mosaics are in same style, especially including emblemas with ancient dolphins and borders with geometric patterns. Similar border compositions are seen in Delos (Greece) and Pergamon (West Anatolia). Notably, in this study bead-reel motif is only seen in Arsameia mosaics (Table 4.1), which is seen in Edessa mosaics as well (Salman, 2007). These mosaics were colored mosaics and made for ceremonial spaces that means can be considered very elaborate just like Samosata mosaics.

Name of the Mosaic	**Arsameia Mosaic 1**
Corpus Number	1
Origin of the mosaic or the Archeological Settlement	Arsameia on the Nymphaios
Function of the Space	Ceremonial Space, Northwest side of Eski Kale
Excavation Date	1954
Period	Late Hellenistic Period
Current location and Protection Status of the Mosaic	Not Secured
Size of the mosaic (in meters)	10.60 x 8.30 m 2.62 x 0.64 m central panel
Technique of the Mosaic	Opus tessellatum
Tesserae Type	Roughly cubic stones, limestone and terracotta
Tesserae Size	1-3 cm borders Smaller tesserae up to 0,5 cm in central panel
Tesserae Shape	Cubic in shape
Tesserae colors	Black, pink, white, red; in dolphins' eyes green, yellow, red
Density	
Mosaic Patterns and descriptions	Six pink petals floral design, Rhodian amphora, ancient Dolphin, triangle (saw-tooth), ivy-scroll border, bead and reel, floral motif, meander, wave (wave-crest), pyramidal crow step, waves and turreted wall (crenellation) motifs
Comment/Explanations	Black color is actually a bluish gray, when it is wet it appears to be black. Information about this mosaic was taken from Irvin's study and the way he named the motifs are added to the patterns section in parenthesis.
Bibliography	Lavin, 1963; Balmelle, et al., 1985; Dörner, 1999; Salman, 2007

Drawings/ Photos

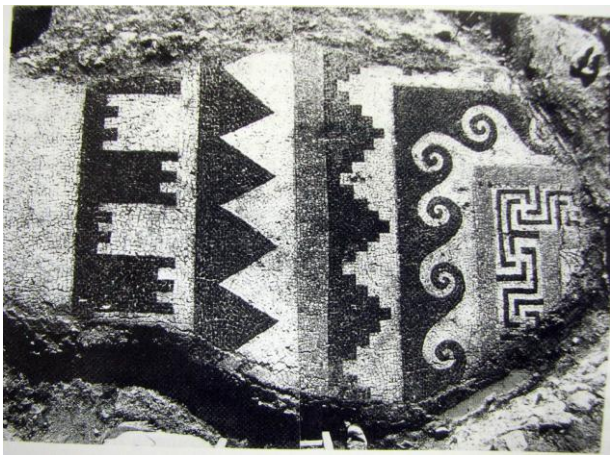


Reconstruction of Arsameia mosaic by George R. H. Wright (Dörner, 1999)

Name of the Mosaic	**Arsameia Mosaic 2**
Corpus Number	2
Origin of the mosaic or the Archeological Settlement	Arsameia on the Nymphaios
Function of the Space	Ceremonial Space II, Eski Kale
Excavation Date	1956
Period	Late Hellenistic Period
Current location and Protection Status of the Mosaic	Not Secured
Size of the mosaic (in meters)	13.85 x 14.62 m
Technique of the Mosaic	Opus tessellatum
Tesserae Type	River pebbles (black) and Cut stone
Tesserae Size	Up to 4cm
Tesserae Shape	Rough compared to Arsameia Mosaic 1
Tesserae colors	Blue-black, white and red
Density	
Mosaic Patterns and descriptions	Turreted wall, crow step, red band, pyramidal crow step, waves and meander
Comment/Explanations	Only a small part of this mosaic was found
Bibliography	Lavin, 1963; Dörner, 1999; Salman, 2007

Drawings/ Photos

(Dörner, 1999)



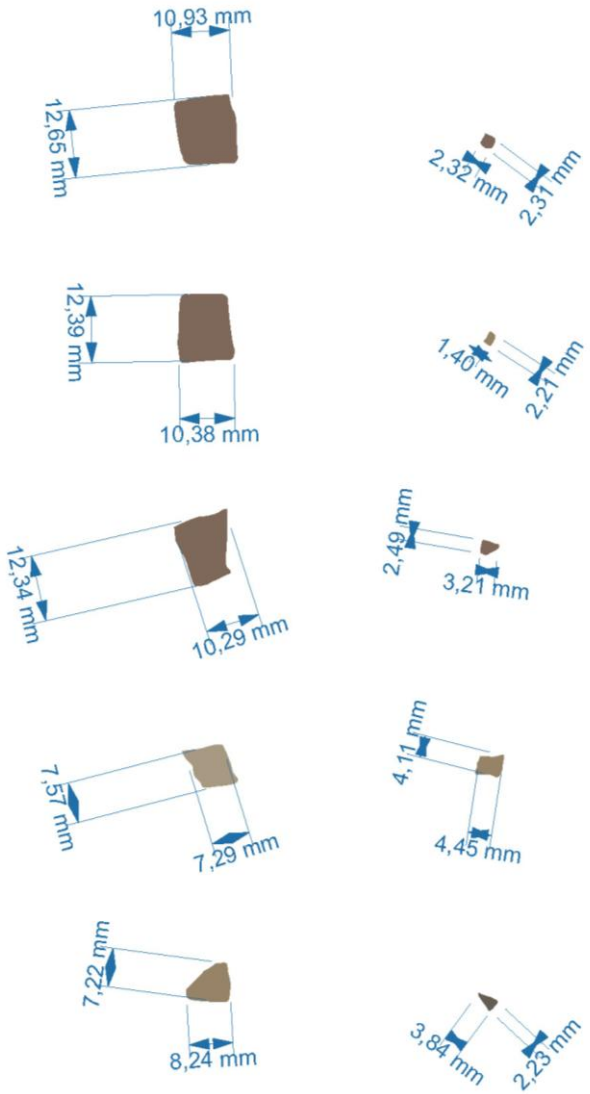
Arsameia Ceremonial mosaic (Salman, 2007)

From Hellenistic Period Samosata mosaics, Mosaic with Fishes is investigated with two figures from central panel and three different areas from borders which are presented below with Corpus numbers 3 and 3a (central figures), 3b, 3c and 3d (borders). Mosaic was unearthed from Samosata palace in 1983. Only central panel is in exhibition today. Mosaic is 4.60 x 3.65 m with borders and central panel is 1.37 x 2.20 m. Density of tesserae in central panel is higher compared to borders, which is incongruent with literature as a typical feature of Hellenistic Period. Tesserae sizes goes down to 0.2 cm in the central panel. Six colors in Corpus No 3 and three in Corpus No 3a were detected. It should also be mentioned there are tones of a specific hue in most of the mosaics. This may be due to weathering which leads to color changes and sometimes result of mastery such as in Zeugma mosaics. In these kinds of situations only hue is selected, measured and recorded.

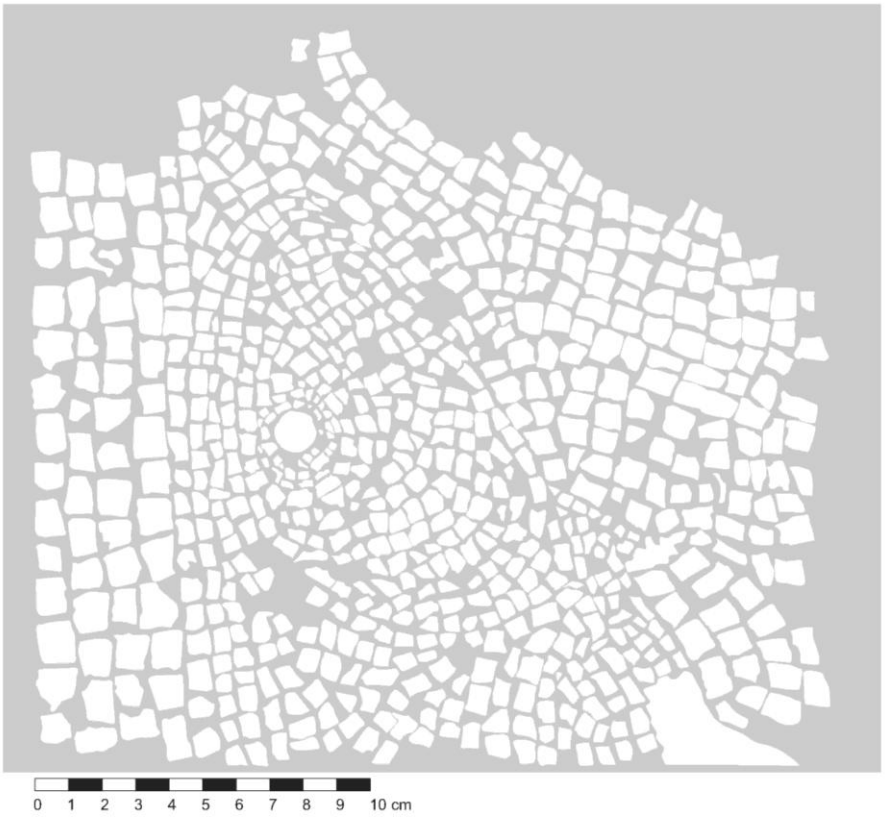
In literature it is generally stated figurative parts of the mosaics contain smaller tesserae and considered as irregular or amorphous shapes. However in tesserae classifications there are numerous quantity of tesserae square-like, rectangle-like etc. Therefore it may be thought that even small tesserae used in figural depictions were cut intentionally with a great ingenuity. In the Mosaic with Fishes (Corpus no 3) there is a definitive piece tessera, which was used to depict the eyeball of the fish. This piece has roundel shape and when other mosaics are investigated generally eyeball was delineated with a circular like shape which hardly seen in other parts of the mosaic (Corpus No: 3, 10b, 14, 15). However it cannot be said it is a standard rule for eye making since in Dionysus, Telete and Skyrtos and Dionysus Medallion mosaics (Corpus No 16, 18) eyeball was represented with rectangular like shapes. Just like Arsameia mosaics, Mosaic with Fishes was made for Samosata Palace and indicates great mastery in technique and making. Therefore central panels include smallest tesserae size compared to other settlements.

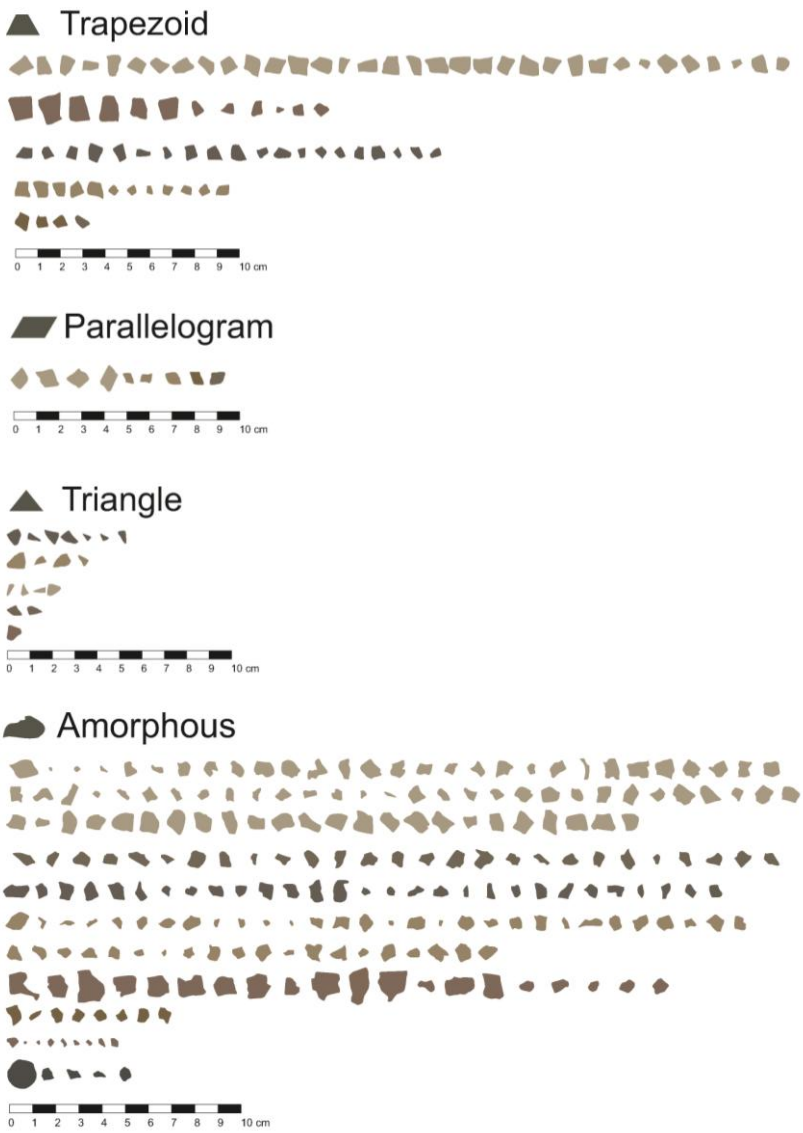
Name of the Mosaic	**Mosaic with Fishes**
Corpus Number	3
Origin of the mosaic or the Archeological Settlement	Samosata Palace (excav. No:st.83-352)
Function of the Space	Room B1
Excavation Date	1983
Period	Late Hellenistic Period (1 Cent BC- 1 Cent AD)
Current location and Protection Status of the Mosaic	Adıyaman Museum, in Exhibition Hall
Size of the mosaic (in meters)	4.60 x 3.65m with borders 1.37 x 2.20m panel
Technique of the Mosaic	Opus tessellatum, opus vermiculatum
Tesserae Type	Cut stone, marble

Tesserae Size
Down to 0.2 mm at figures



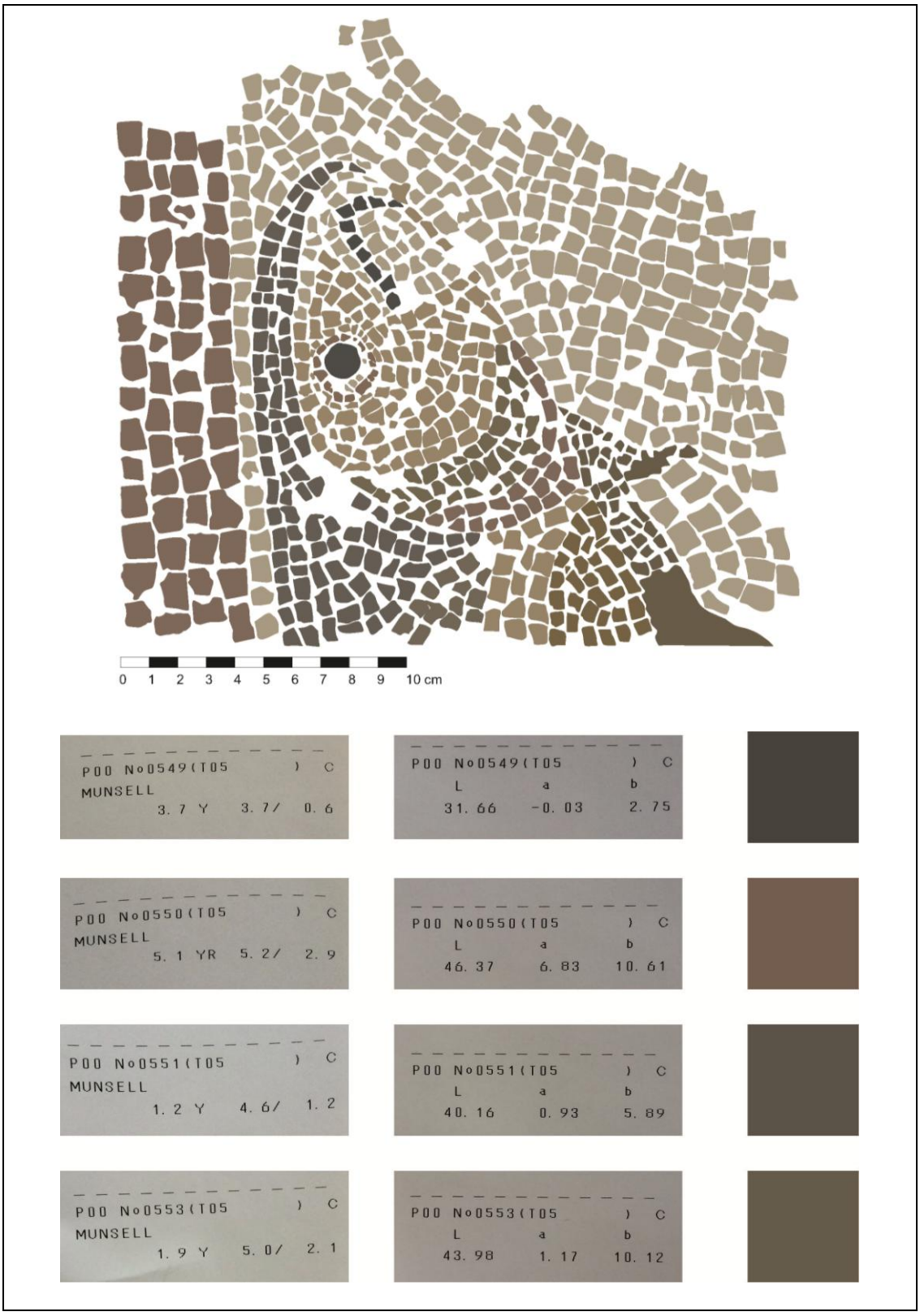
Tesserae Shape





% of tesserae : Square 20% Rectangle 32% Trapezoid 11% Parallelogram 1%
Triangle 2% Amorphous 31%

Tesserae Color Black, white, brown, green, cream, yellow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P00 No0549(T05) C
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3.7 Y 3.7/ 0.6
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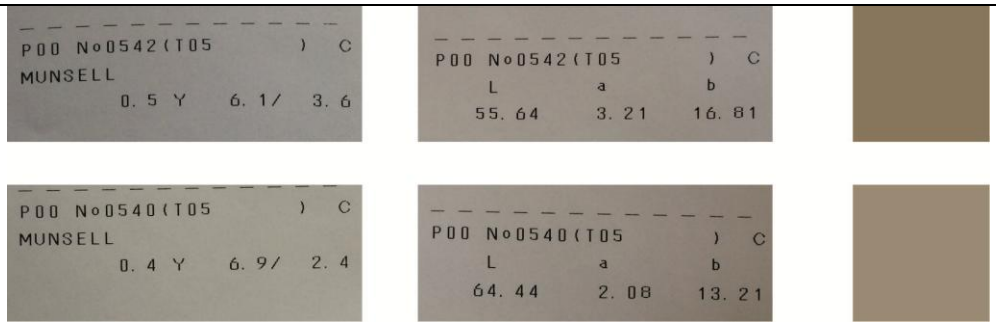
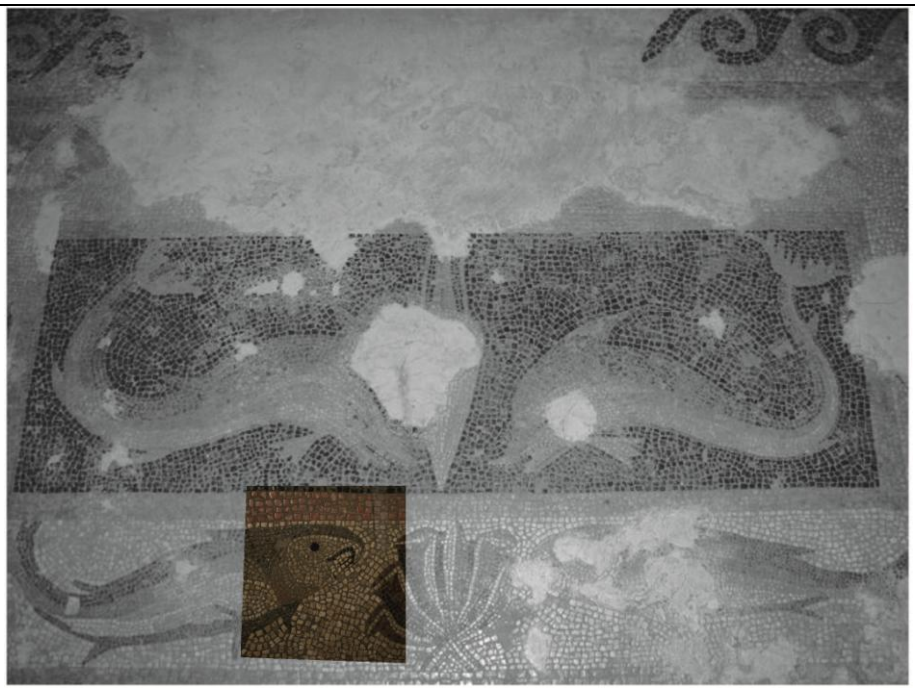
L a b
31.66 -0.03 2.75
P00 No0550(T05) C
MUNSELL
5.1 YR 5.2/ 2.9
P00 No0550(T05) C
L a b
46.37 6.83 10.61
P00 No0551(T05) C
MUNSELL
1.2 Y 4.6/ 1.2
P00 No0551(T05) C
L a b
40.16 0.93 5.89
P00 No0553(T05) C
MUNSELL
1.9 Y 5.0/ 2.1
P00 No0553(T05) C
L a b
43.98 1.17 10.12

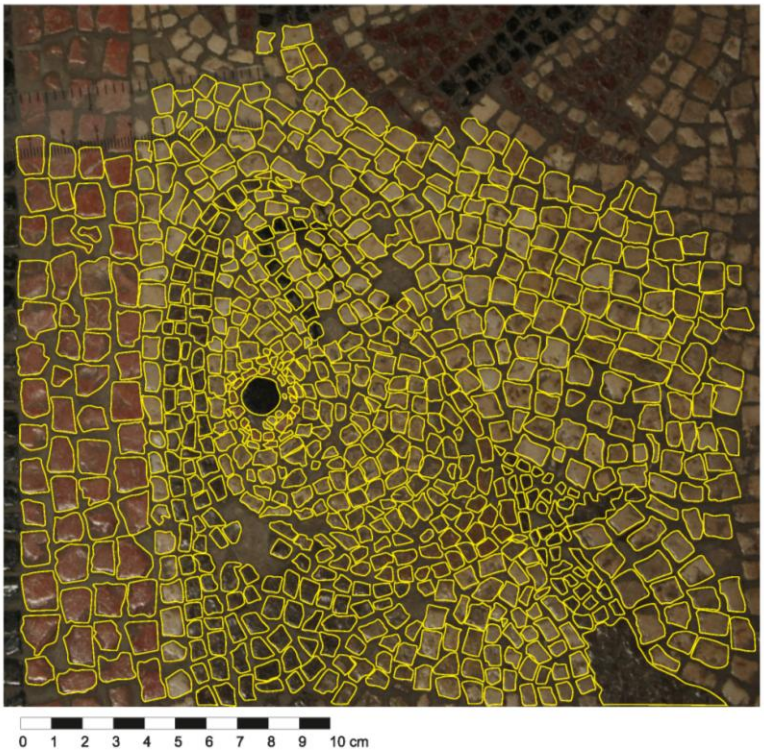


Density	Emblema 240-250 T/dm^2
Mosaic Patterns and descriptions	Pyramidal crow step, stripes, waves, meander 
Comment/Explanations	
Bibliography	Bingöl, 2013; Özgüç, 1985; Salman, 2007

Drawings/ Photos

Reconstruction drawing by Elif Kökdemir

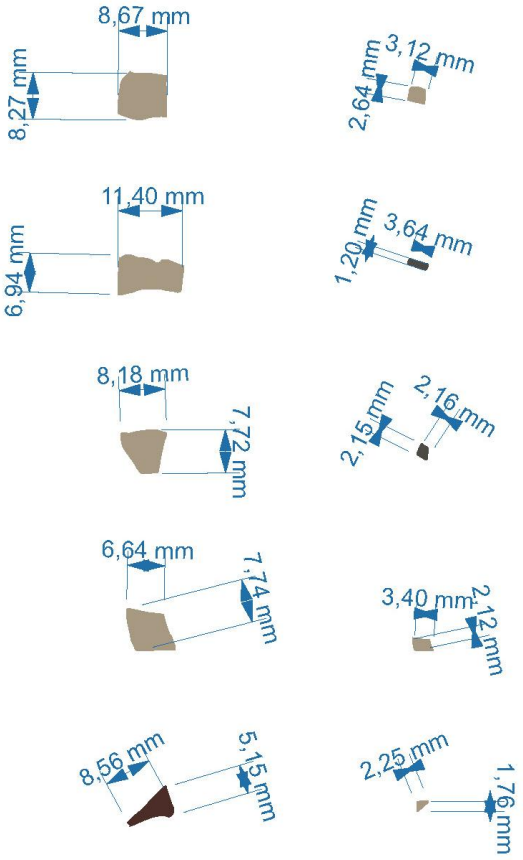



0 1 2 3 4 5 6 7 8 9 10 cm

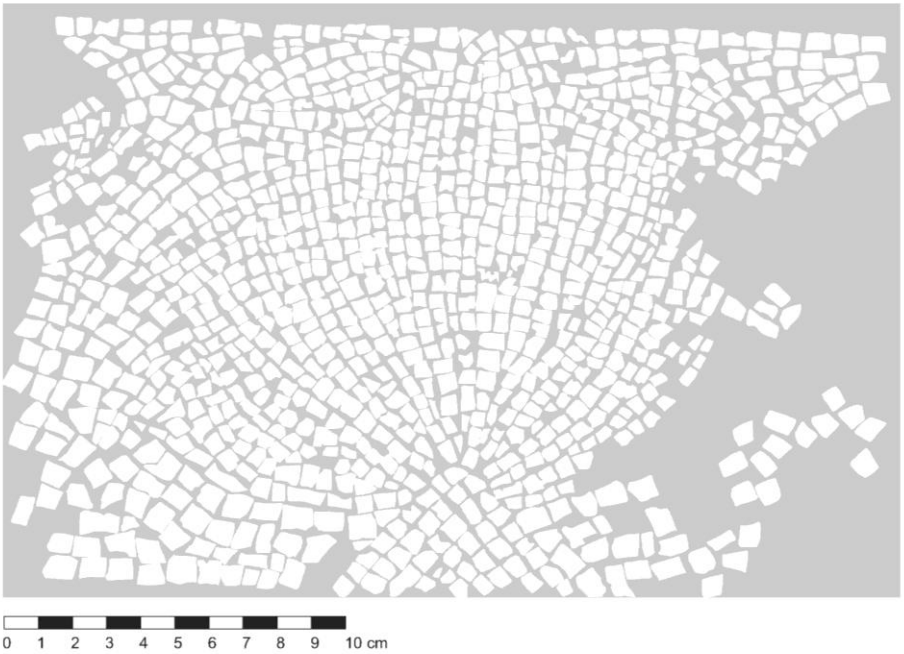
Name of the Mosaic	**Mosaic with Fishes**
Corpus Number	3a
Origin of the mosaic or the Archeological Settlement	Samosata Palace, (excav. no: st.83–352)
Function of the Space	Room B1
Excavation Date	1983
Period	Late Hellenistic Period (1 Cent BC- 1 Cent AD)
Current location and Protection Status of the Mosaic	Adıyaman Museum's archive
Size of the mosaic (in meters)	4.60 x 3.65m with borders 1.37 x 2.20m panel
Technique of the Mosaic	Opus tessellatum, opus vermiculatum
Tesserae Type	Cut stone, marble

Tesserae Size

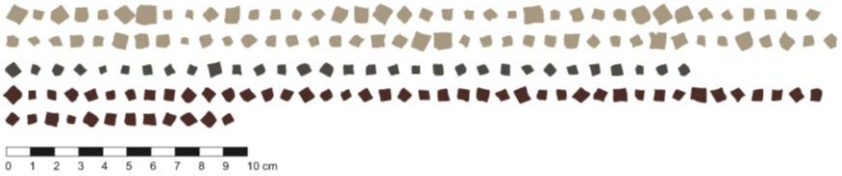
Up to 2 cm



Tesserae Shape

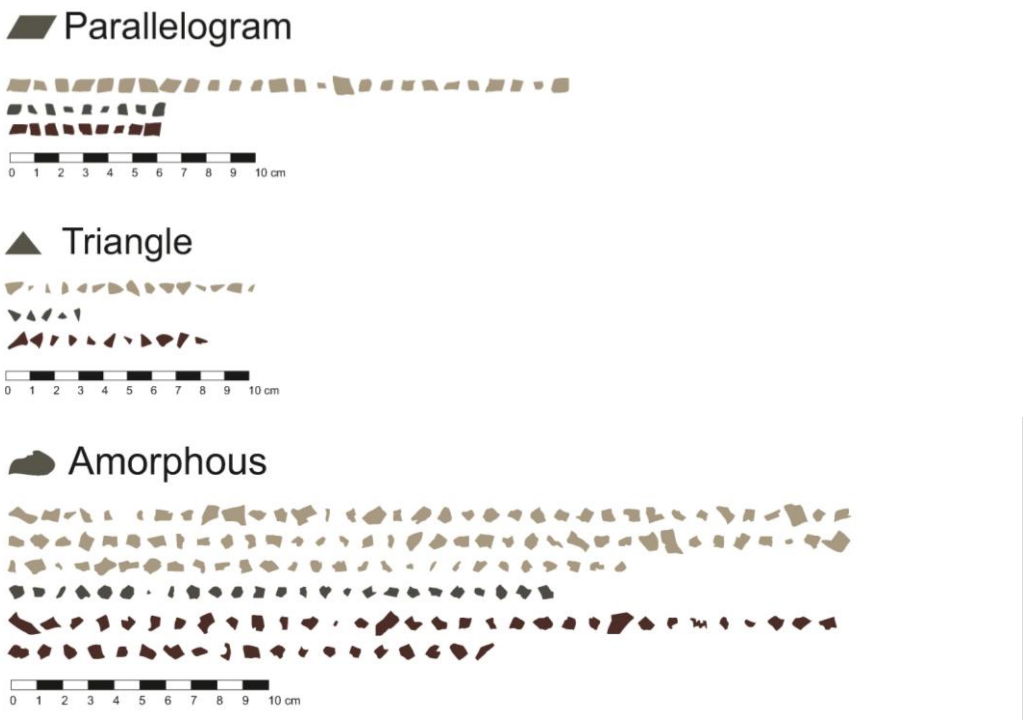


Square



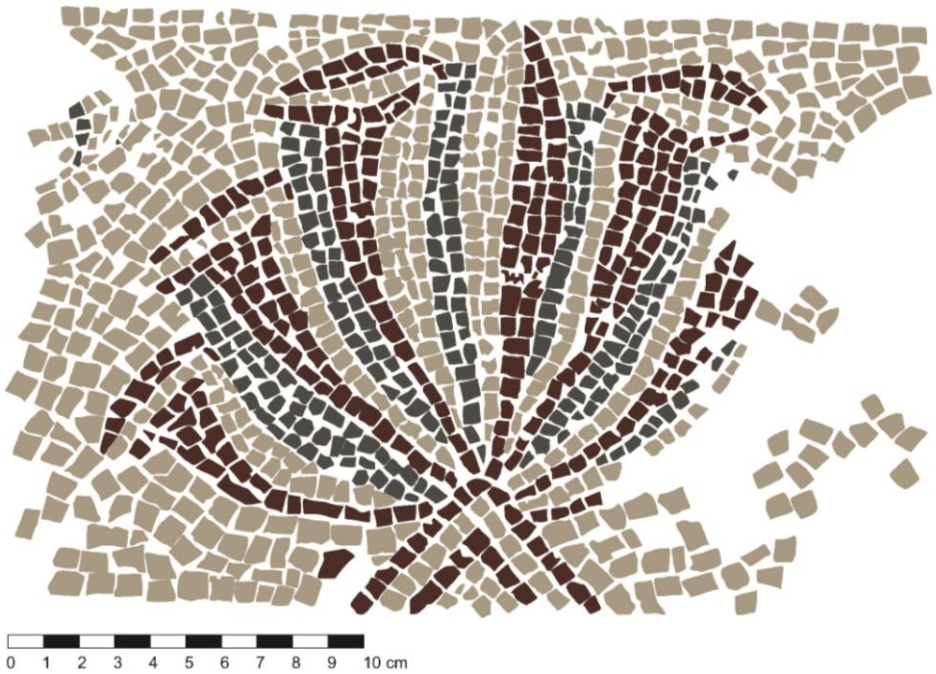
Rectangle

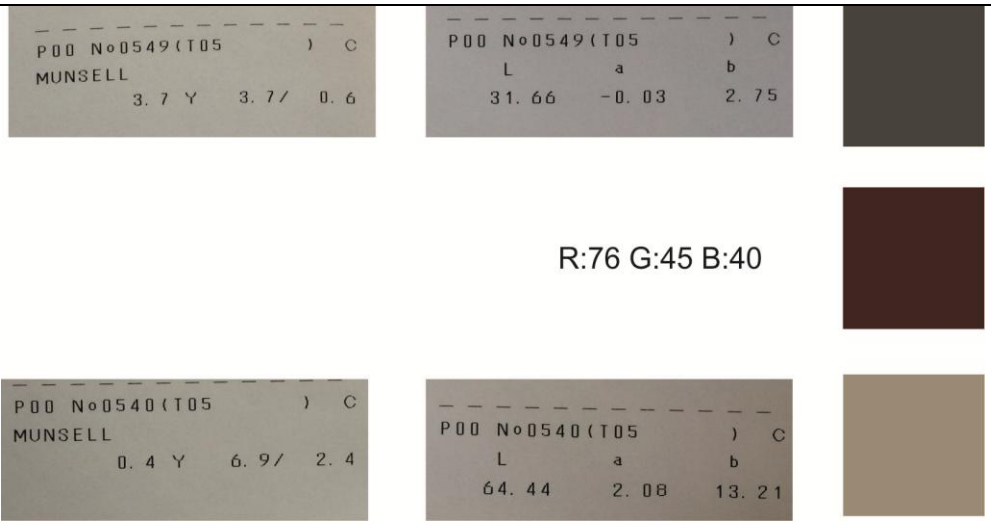
Trapezoid



% of tesserae : Square 15% Rectangle 44% Trapezoid 15% Parallelogram 4% Triangle 2% Amorphous 16%

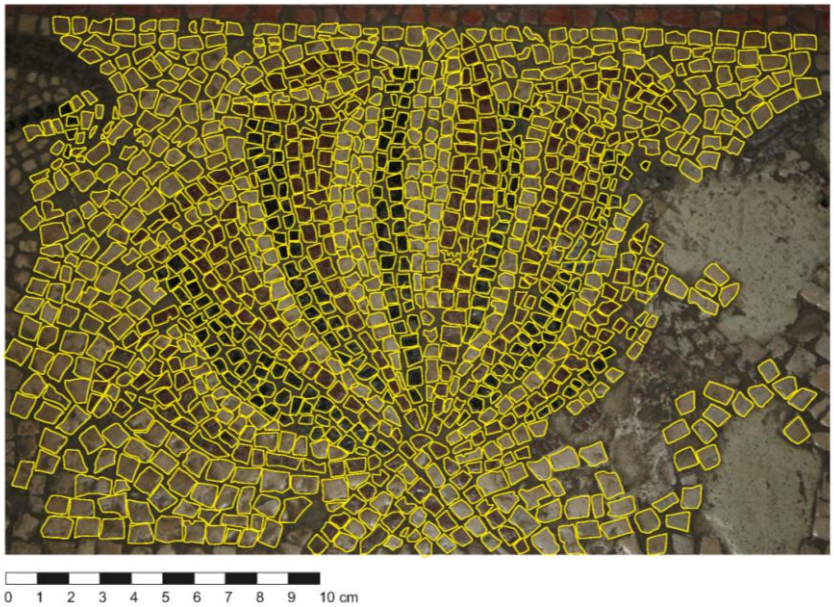
Tesserae colors





Density	350-375 T/dm^2
Mosaic Patterns and descriptions	Pyramidal crow step
Comment/Explanations	
Bibliography	Bingöl, 2013; Özgüç, 1985; Salman, 2007

Drawings/ Photos


0 1 2 3 4 5 6 7 8 9 10 cm

Borders of Mosaic with Fishes are investigated in different three parts (Corpus No 3b, 3c and 3d). Tesserae size goes up to 2 cm. Motifs are pyramidal crow step, wave and meander which are incongruent with common motifs of the Late Hellenistic period (Table 4.1) which are also seen in Arsameia mosaics. Three colors were detected. In general borders are black and white/beige though a reddish color was added in meander.

Table 4.1 Motifs abundance in Commagene Region mosaics

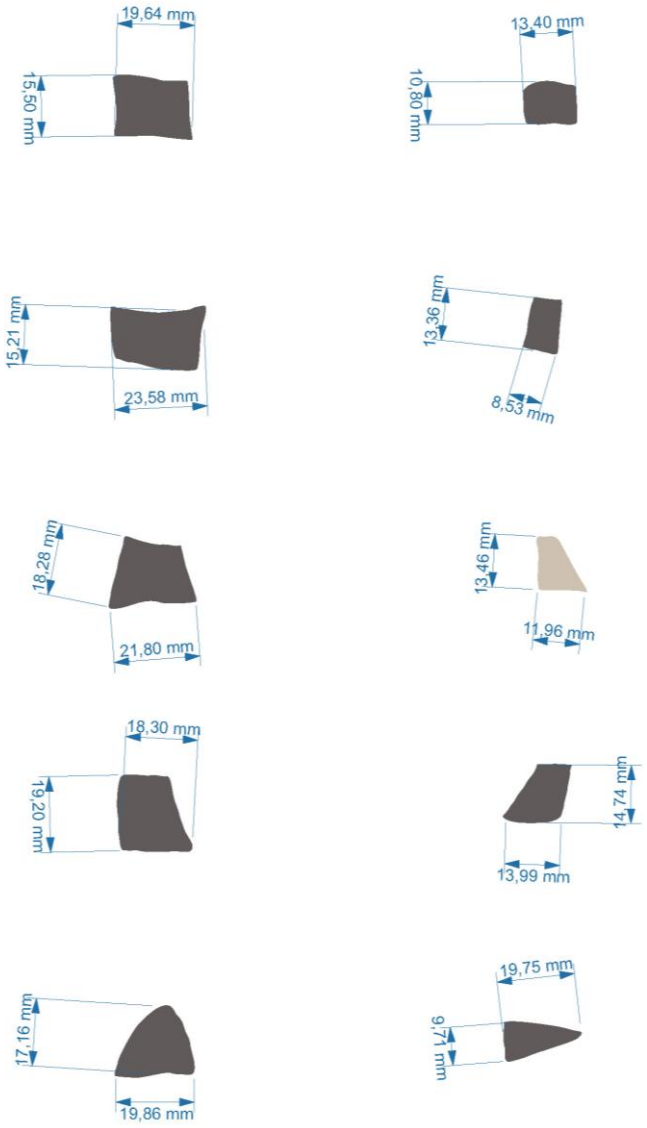
	Arsameia	Samosata	Perrhe	Bahasna	Zeugma
Waves	xxx	xxx			xxx
Turreted Wall	xxx				
Crow step	x	xx			xxx
Meander	xxx	xxx	xx	xx	xx
Bead-reel	x				
Guilloches			xx		xxx
Pyramidal Crow step	xxx	xxx			
Equilateral quadrangles			x	x	x
Rosette			x		
Zigzag			xx		xx
Peltarion					x
Intersecting Circles				xx	x
Solomon Knots					x
Swastikas					xx

xxx: common/dominant xx: moderate x: occasional

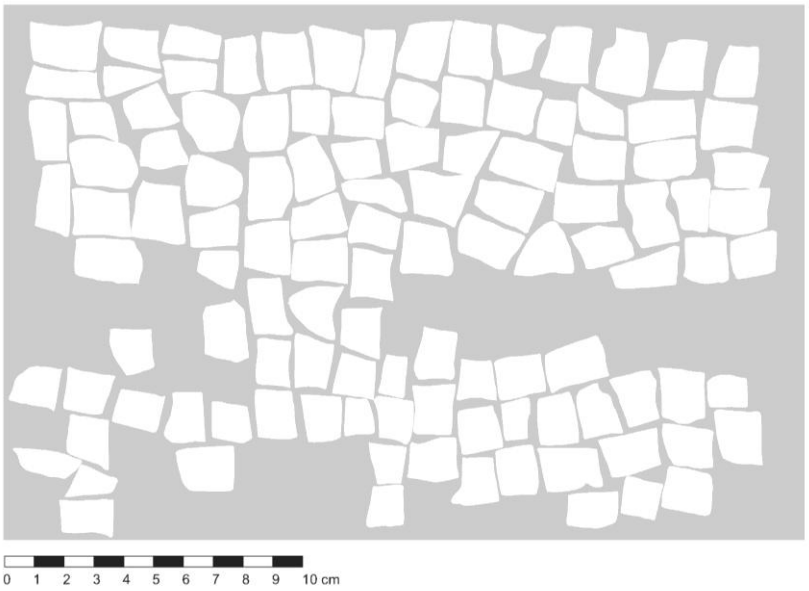
Name of the Mosaic	**Mosaic with Fishes (Borders)**
Corpus Number	3b
Origin of the mosaic or the Archeological Settlement	Samosata Palace, (excav. no: st.83–352)
Function of the Space	Room B1
Excavation Date	1983
Period	Late Hellenistic Period (1 Cent BC- 1 Cent AD)
Current location and Protection Status of the Mosaic	Adıyaman Museum's archive
Size of the mosaic (in meters)	4.60 x 3.65m
Technique of the Mosaic	Opus tessellatum
Tesserae Type	Cut stone, marble

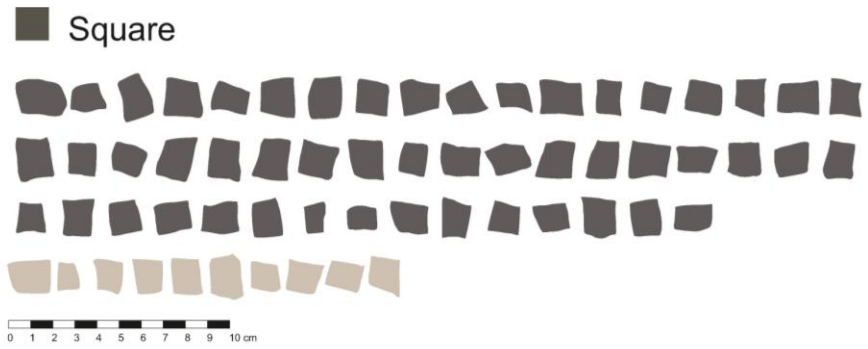
Tesserae Size

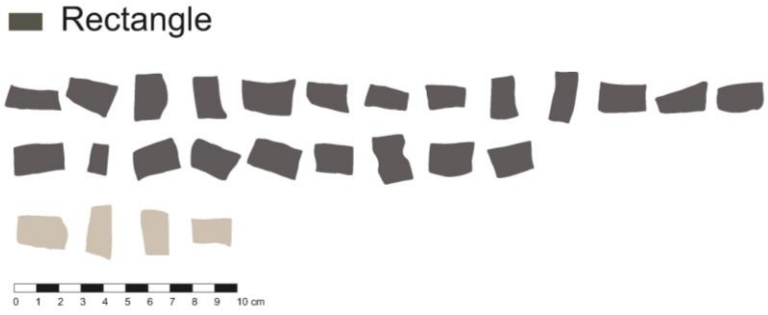
Up to 2 cm

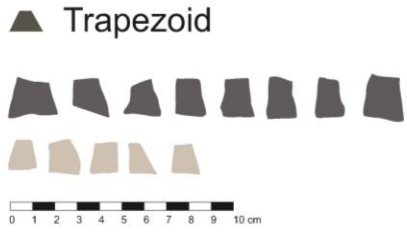


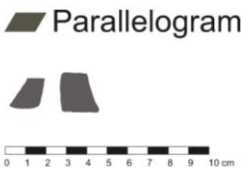
Tesserae Shape

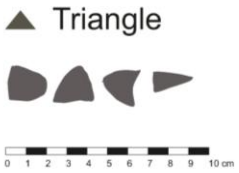


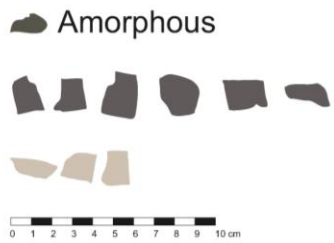






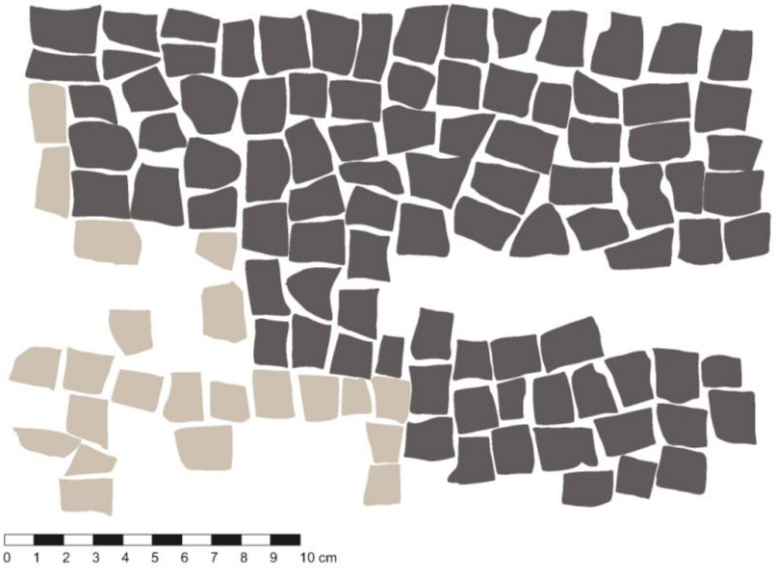


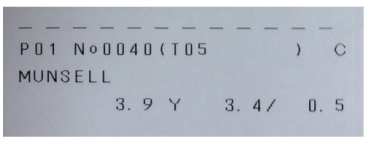


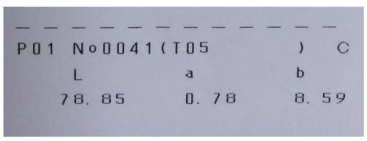


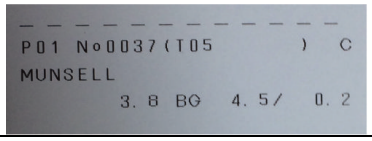
% of tesserae : Square 53% Rectangle 22% Trapezoid 11% Parallelogram 1%
Triangle 3% Amorphous 7%

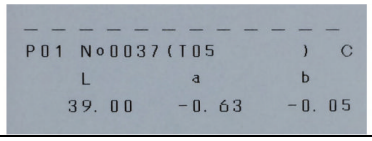
Tesserae colors











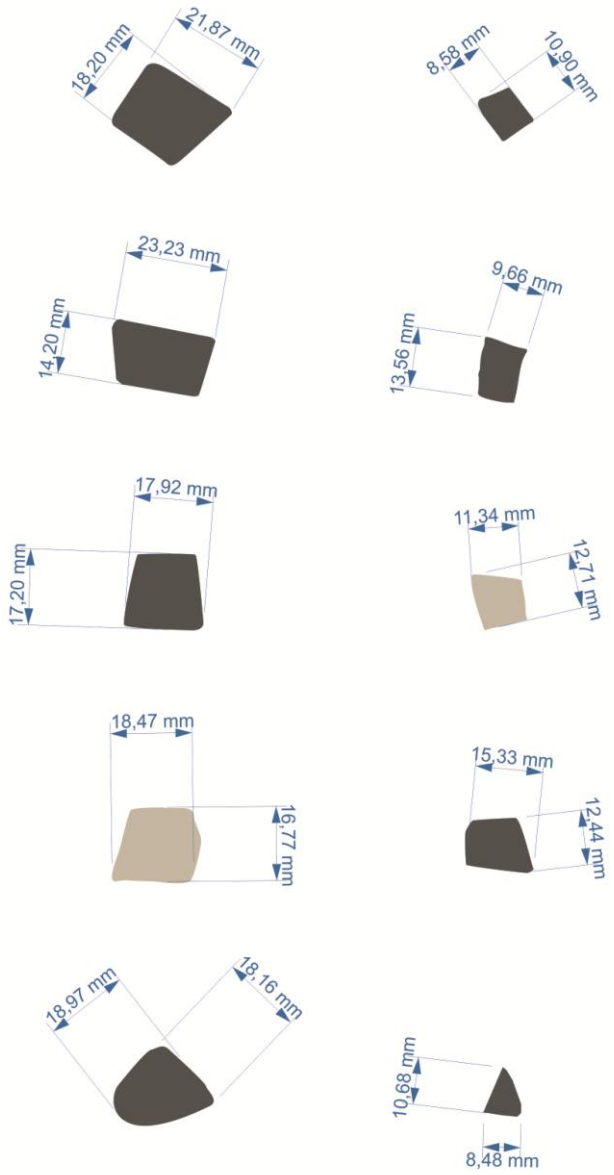
Density	40-60 T/dm^2
Mosaic Patterns and descriptions	Pyramidal crow step
Comment/Explanations	
Bibliography	Bingöl, 2013; Özgüç, 1985; Salman, 2007

Drawings/ Photos

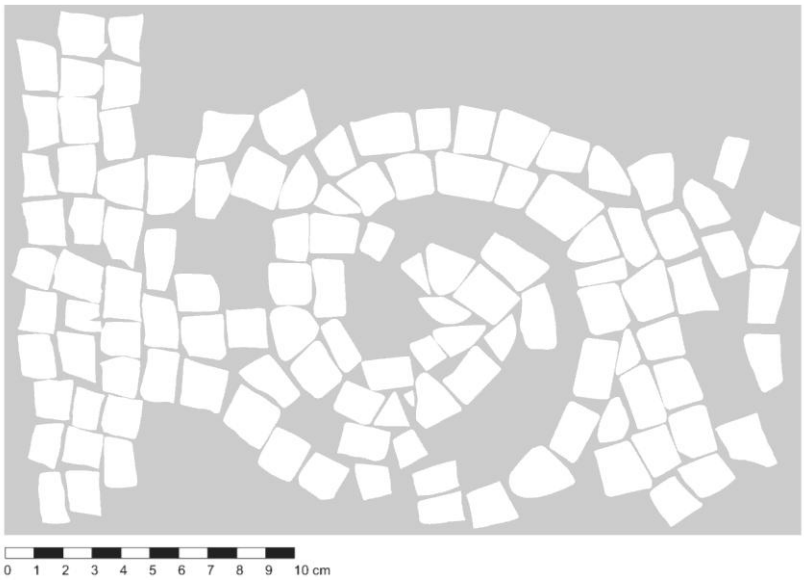
Name of the Mosaic	**Mosaic with Fishes (Borders)**
Corpus Number	3c
Origin of the mosaic or the Archeological Settlement	Samosata Palace, (excav. no: st.83–352)
Function of the Space	Room B1
Excavation Date	1983
Period	Late Hellenistic Period (1 Cent BC- 1 Cent AD)
Current location and Protection Status of the Mosaic	Adıyaman Museum's archive
Size of the mosaic (in meters)	4.60 x 3.65m
Technique of the Mosaic	Opus tessellatum
Tesserae Type	Cut stone, marble

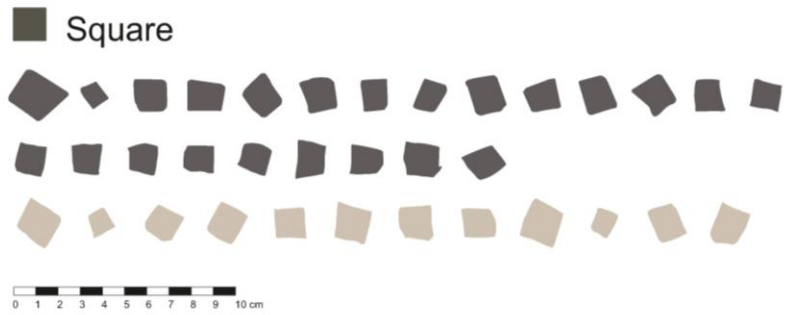
Tesserae Size

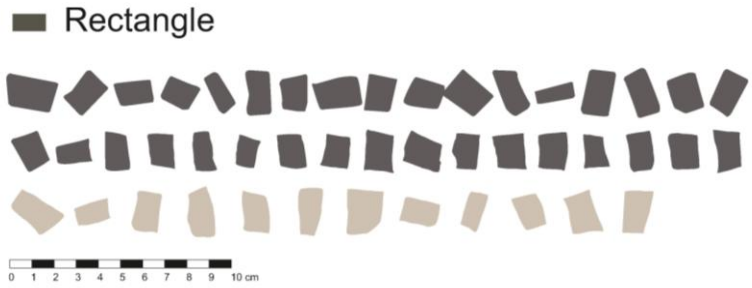
Up to 2 cm

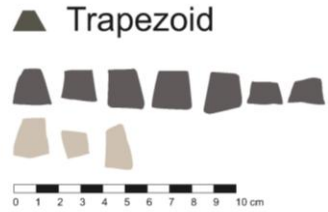


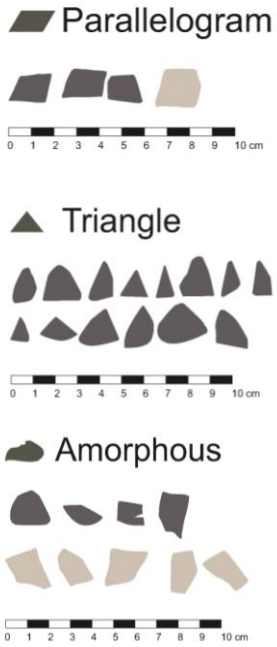
Tesserae Shape





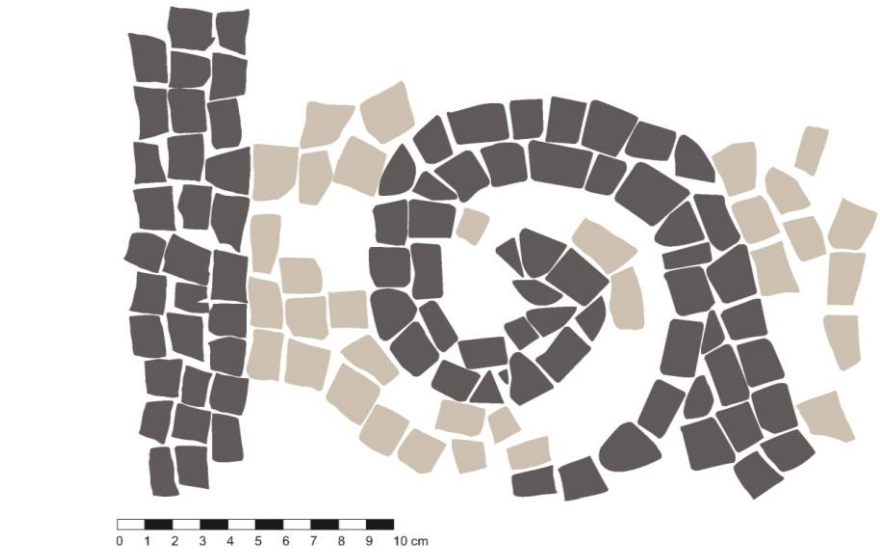


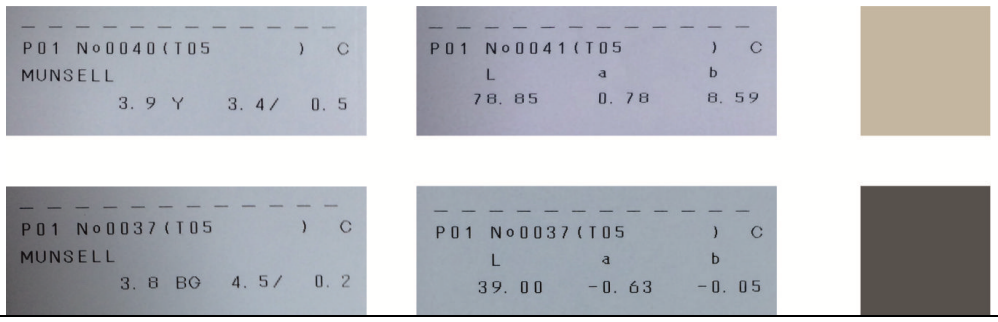




% of tesserae : Square 29% Rectangle 38% Trapezoid 8% Parallelogram 3% Triangle 11% Amorphous 7%

Tesserae colors





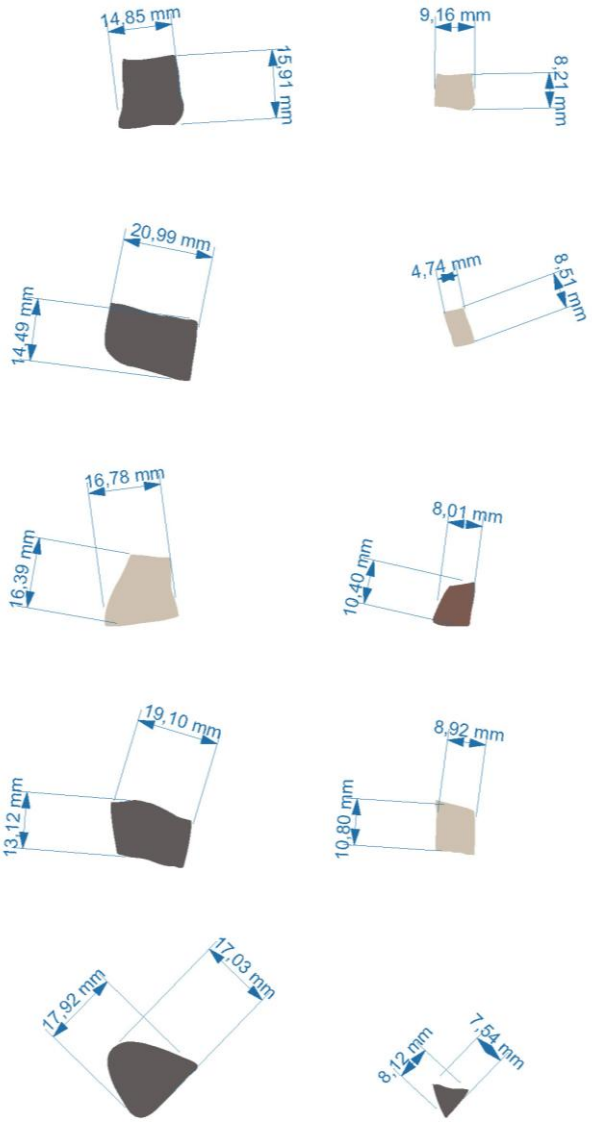
Density	40-60 T/dm^2
Mosaic Patterns and descriptions	Waves
Comment/Explanations	
Bibliography	Bingöl, 2013; Özgüç, 1985; Salman, 2007

Drawings/ Photos

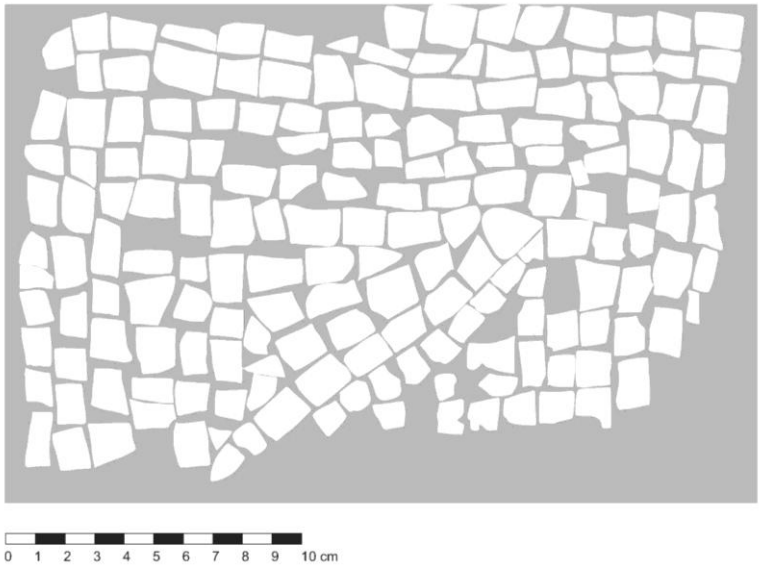
Name of the Mosaic	**Mosaic with Fishes (Borders)**
Corpus Number	3d
Origin of the mosaic or the Archeological Settlement	Samosata Palace(excav. no: st.83–352)
Function of the Space	Room B1
Excavation Date	1983
Period	Late Hellenistic Period (1 Cent BC- 1 Cent AD)
Current location and Protection Status of the Mosaic	Adıyaman Museum's archive
Size of the mosaic (in meters)	4.60 x 3.65m
Technique of the Mosaic	Opus tessellatum
Tesserae Type	Cut stone, marble

Tesserae Size

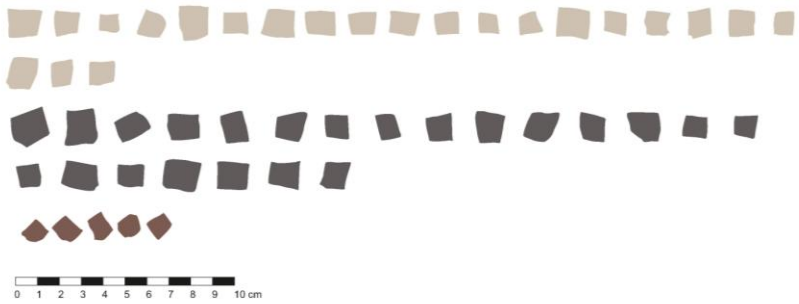
Up to 2 cm



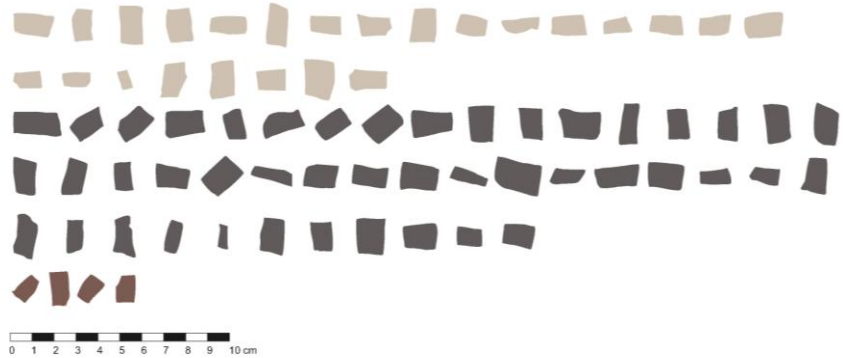
Tesserae Shape

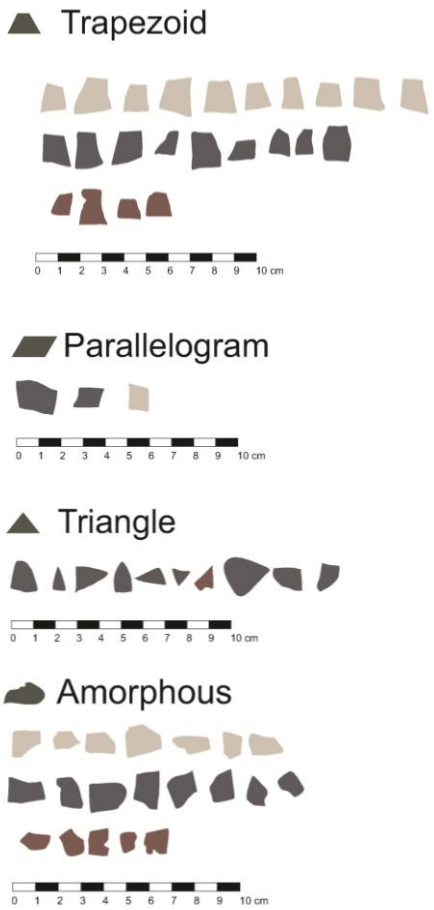


Square



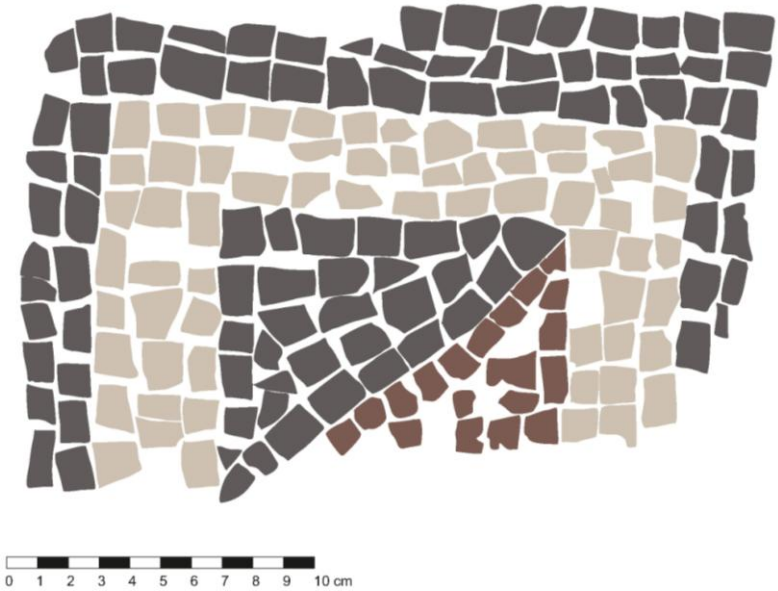
Rectangle

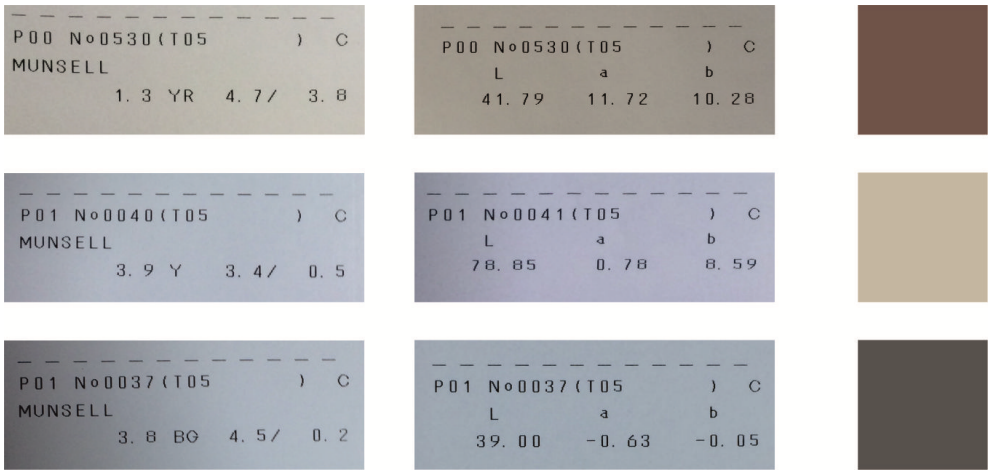




% of tesserae : Square 27% Rectangle 41% Trapezoid 12% Parallelogram 1% Triangle 5% Amorphous 11%

Tesserae colors





Density	40-60 T/dm^2
Mosaic Patterns and descriptions	Meander
Comment/Explanations	
Bibliography	Bingöl, 2013; Özgüç, 1985; Salman, 2007

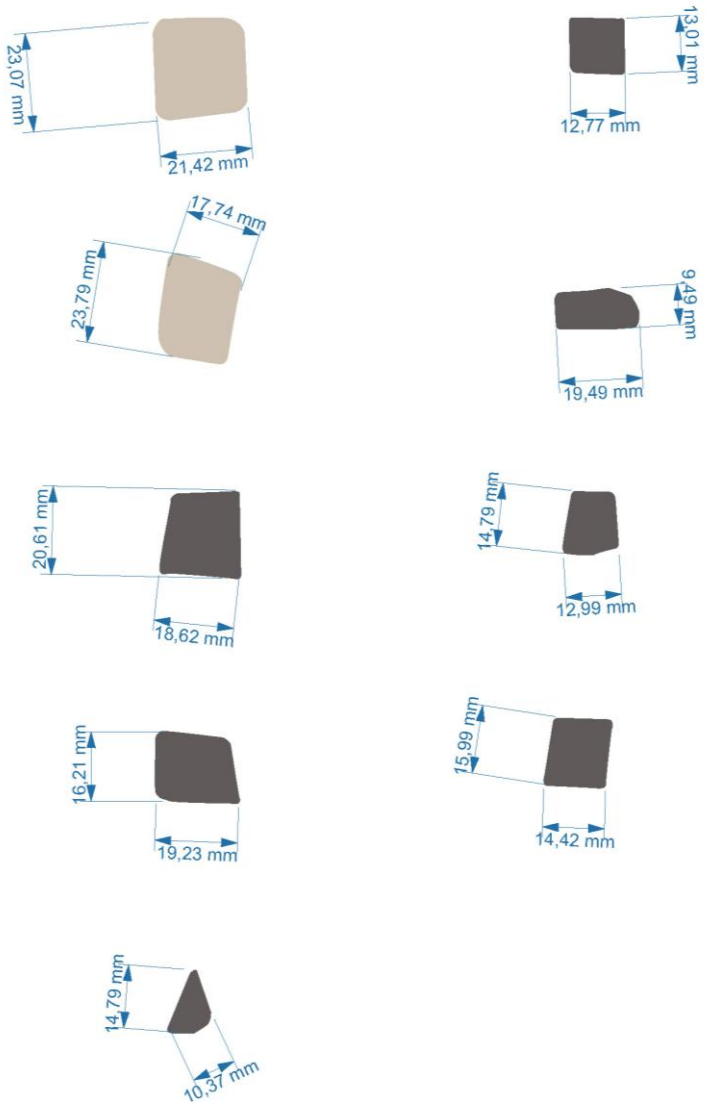
Drawings/ Photos

Chequerboard Mosaic is from corridor of Samosata Palace and was excavated in 1983. Mosaic was secured in three pieces and sizes are 4.65x1.65 m. Technique is opus tessellatum similar with Hellenistic Period mosaics. White/beige and black colors were used. Despite it belongs to Samosata Palace, this mosaic seems to be a functional mosaic without aesthetic concerns, only to fill the corridor opening to a hall adorned with mosaic.

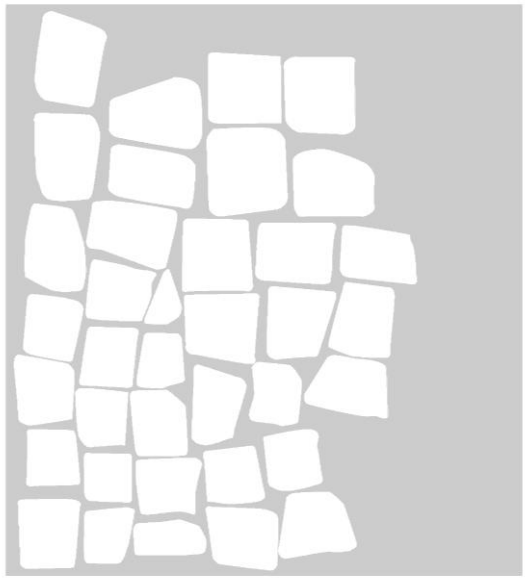
Name of the Mosaic	**Chequerboard Mosaic**
Corpus Number	4
Origin of the mosaic or the Archeological Settlement	Samosata Palace, B2 (excav. no: st.83–351)
Function of the Space	Corridor
Excavation Date	1983
Period	Late Hellenistic Period
Current location and Protection Status of the Mosaic	Adıyaman Museum's archive
Size of the mosaic (in meters)	4.65x1.65 m (3 pieces)
Technique of the Mosaic	Opus tessellatum
Tesserae Type	Cut stone

Tesserae Size

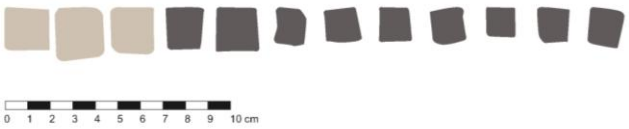
2-3 cm



Tesserae Shape



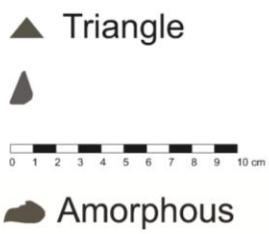
Square



Rectangle

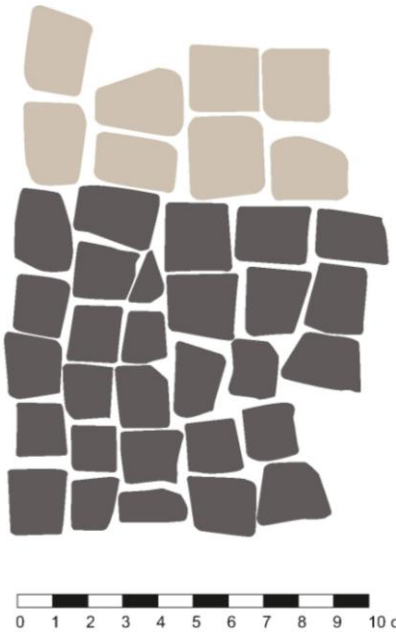
Trapezoid

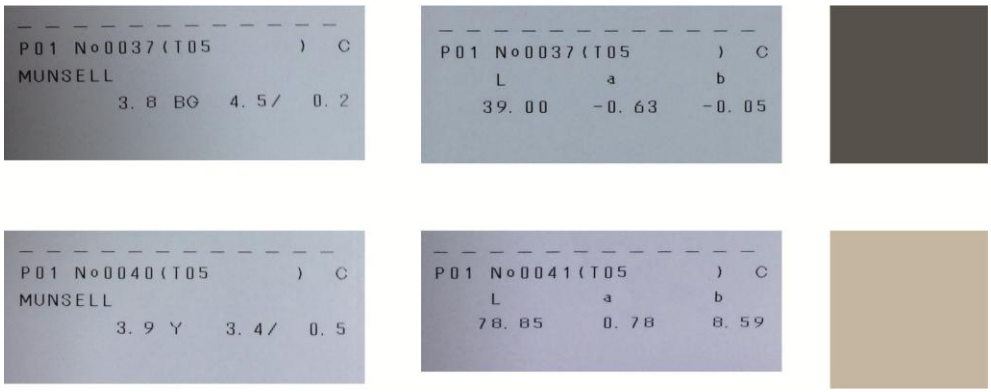
Parallelogram



% of tesserae : Square 32% Rectangle 21% Trapezoid 35% Parallelogram 8%
Triangle 2% Amorphous 0%

Tesserae colors Black and white

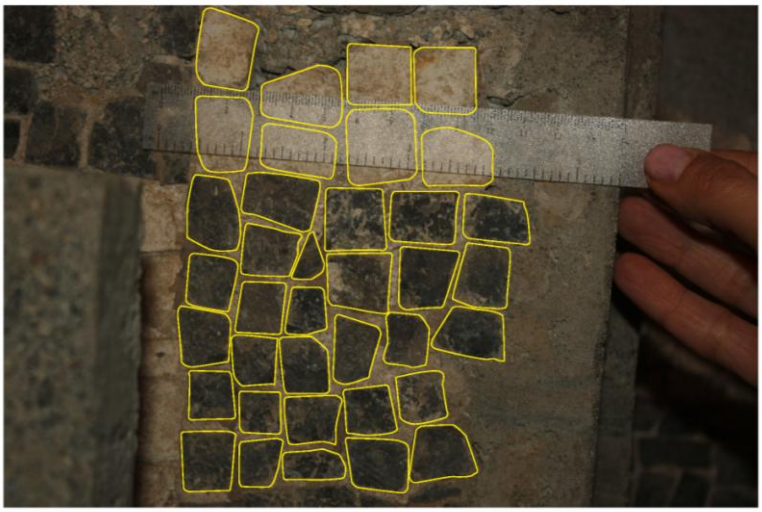




Density	40-45 T/dm^2 Each board piece (10x10 cm) has 25-35 tesserae
Mosaic Patterns and descriptions	Chequerboard
Comment/Explanations	It is the corridor mosaic of the palace and carried in three pieces. Geometrical mosaic is made of black and white tesserae without any figures; is a rectangular pavement. Tesserae were cut coarsely

	and set to the floor.
Bibliography	Bingöl, 2013; Özgüç, 1985; Salman, 2007

Drawings/ Photos



Name of the Mosaic	**Big Hall Mosaic Pieces**
Corpus Number	5
Origin of the mosaic or the Archeological Settlement	Samosata Palace (excav. no: st.83–351)
Function of the Space	Palace Hall, Room B2
Excavation Date	1983
Period	Late Hellenistic Period
Current location and Protection Status of the Mosaic	Adıyaman Museum's archive
Size of the mosaic (in meters)	13 m in total (in four pieces) 2 pieces 1.90 x1.30 m, 1 piece 2.00 x1.30 m, 1 piece 1.25 x1.25 m
Technique of the Mosaic	Opus tessellatum
Tesserae Type	Cut stone
Tesserae Size	1-3 cm
Tesserae Shape	
Tesserae colors	Black and white and brown
Density	50 -70 T/dm^2
Mosaic Patterns and descriptions	Crow step, waves and meander
Comment/Explanations	Central part of the mosaic was not found during excavations. Therefore it was either got lost or there was a shallow pool in the center of the hall therefore designed without mosaic.
Bibliography	Bingöl, 2013; Özgüç, 1985; Salman, 2007

Drawings/ Photos

(Salman, 2007)

(Salman, 2007)

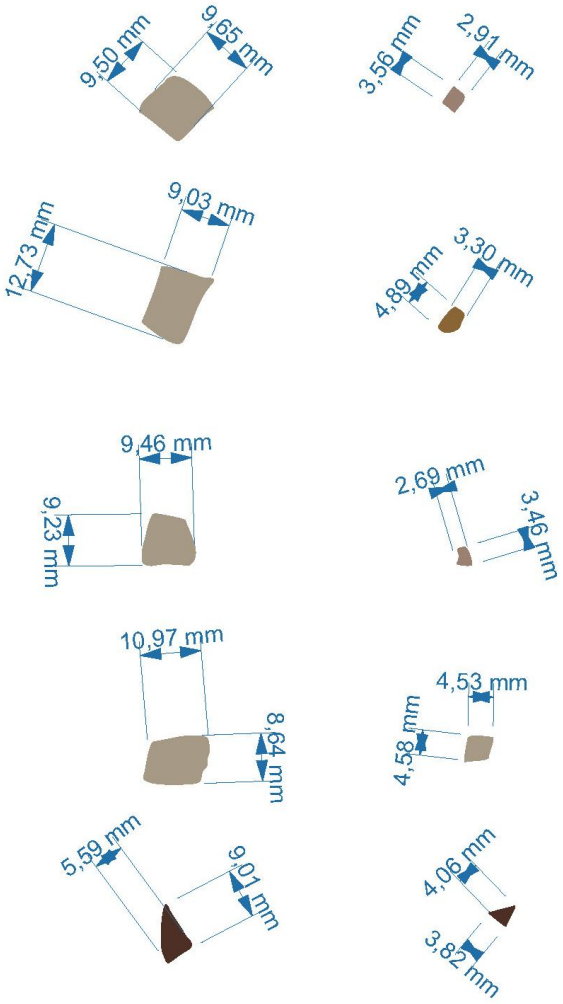
Samosata Palace Big Hall Mosaic (Corpus No 5) was found in 1983 only as a rectangular border without central panel. It might get lost due to burglary or it may indicate presence of a shallow pool or courtyard. Even if it had central panel, smaller tesserae could be obtained as in the other mosaics found in the palace. This mosaic was in Adıyaman Museum's archive and due to archive conditions could not be investigated in this study. However the style is similar to the other Palace mosaics excavated from Samosata. Opus tessallatum was employed and tesserae size is 1-3 cm similar to the other borders found in the palace.

Last mosaic from Samosata belongs to a Byzantium Period (Corpus No 6) and with period shift, colors detected from mosaic ascended. Opus vermiculatum technique was used on mosaic and since the mosaic was highly damaged there are no clues for borders around the figurative panel. Selected part for the tesserae shape study belongs to the face of a being (According to Salman (2007) this face cannot be a normal human face considering its eyes, it's more likely a heavenly creature, his legs are not on ground as well; holding a ram most probably giving it to Prophet Abraham) including different colors. Face is damaged and only a little remained from whole mosaic but the remaining part still contains different colors. There are some other different hues out of selected part which were measured also, added to the color atlas prepared (Appendix A). Another notable feature in this mosaic is use of material. For the first time there is green smalti (glass tesserae) use along green tesserae in one of the Samosata mosaics.

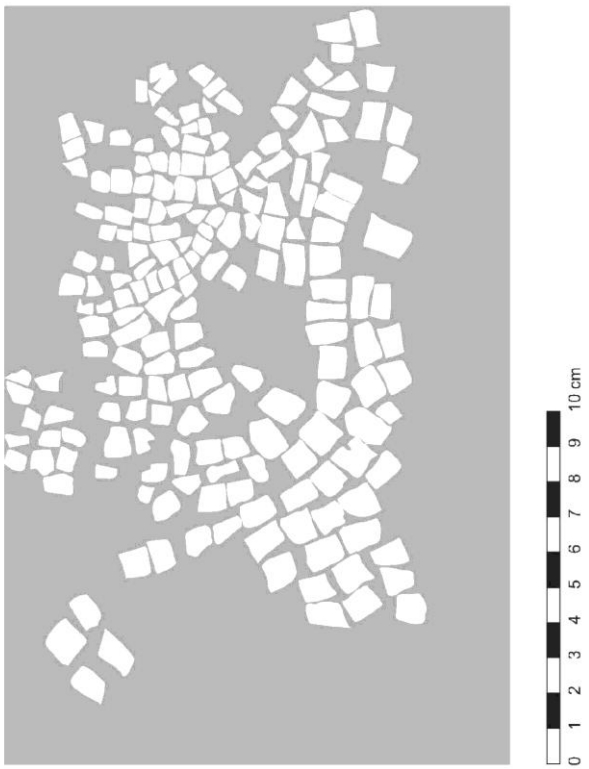
Name of the Mosaic	**Byzantium Mosaic**
Corpus Number	6
Origin of the mosaic or the Archeological Settlement	Samosata (excav. no: st. 85–349)
Function of the Space	Function of the building is unknown
Excavation Date	1983
Period	Byzantium (6-7 Cent AD)
Current location and Protection Status of the Mosaic	Adıyaman Museum's archive
Size of the mosaic (in meters)	1.70 x 1.20 m
Technique of the Mosaic	Opus vermiculatum
Tesserae Type	Cut Stone and Smalti

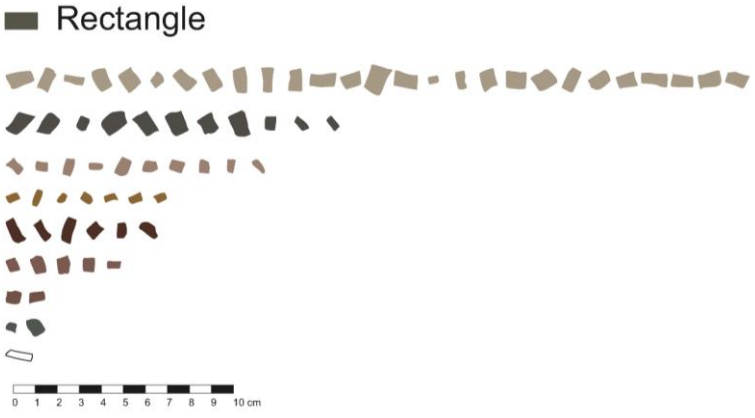
Tesserae Size

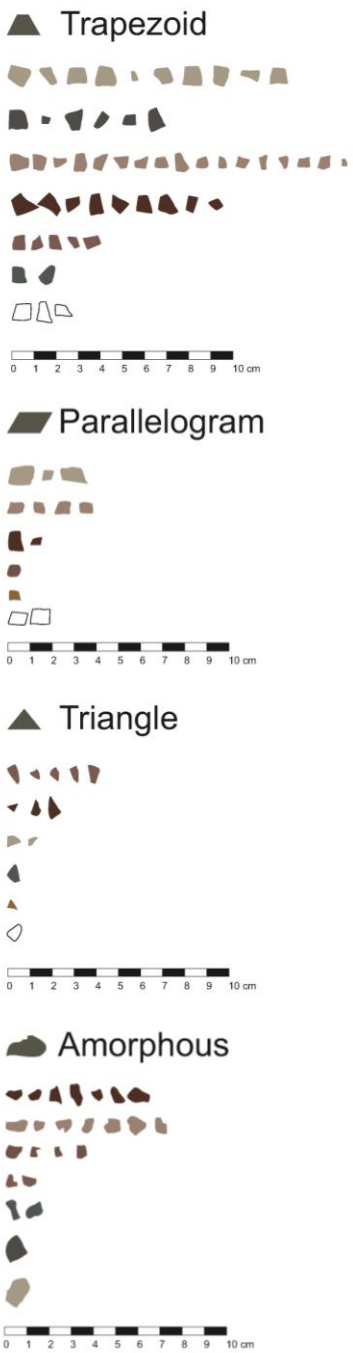
0,5-1 cm



Tesserae Shape







% of tesserae : Square 10% Rectangle 37% Trapezoid 26% Parallelogram 6% Triangle 6% Amorphous 12%

Tesserae colors Black, white, brown, yellow, green- green smalti

P00 No0522(T05) C
L a b
38.39 11.05 9.86

P00 No0522(T05) C
MUNSELL
1.7 YR 4.4/ 3.7

P00 No0523(T05) C
MUNSELL
0.4 G 4.1/ 0.9

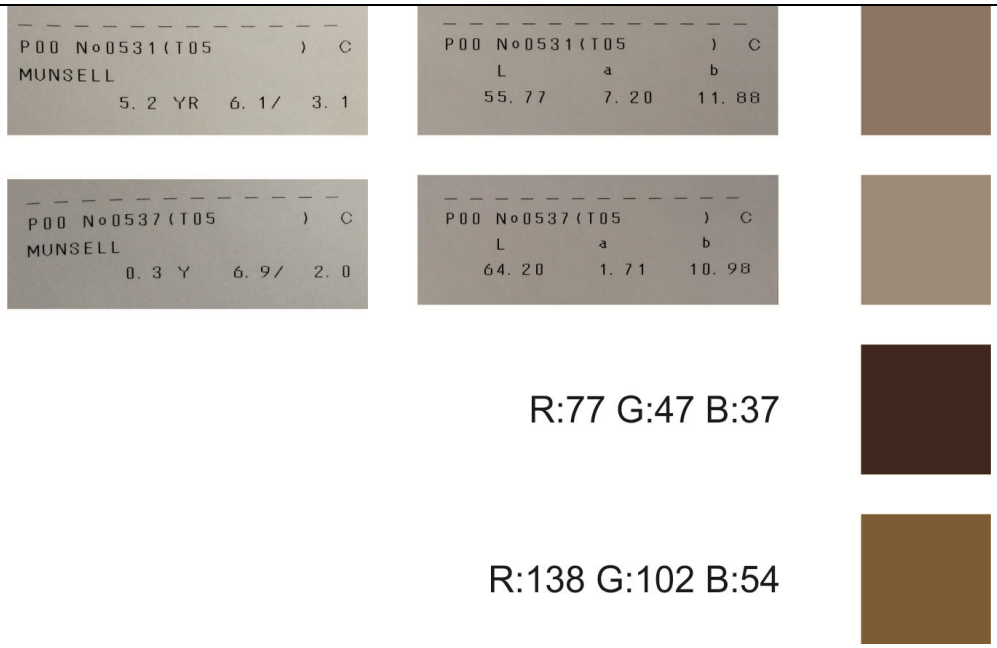
P00 No0523(T05) C
L a b
35.89 -3.15 2.29

P00 No0526(T05) C
MUNSELL
2.3 Y 3.7/ 0.4

P00 No0526(T05) C
L a b
32.00 0.17 1.95

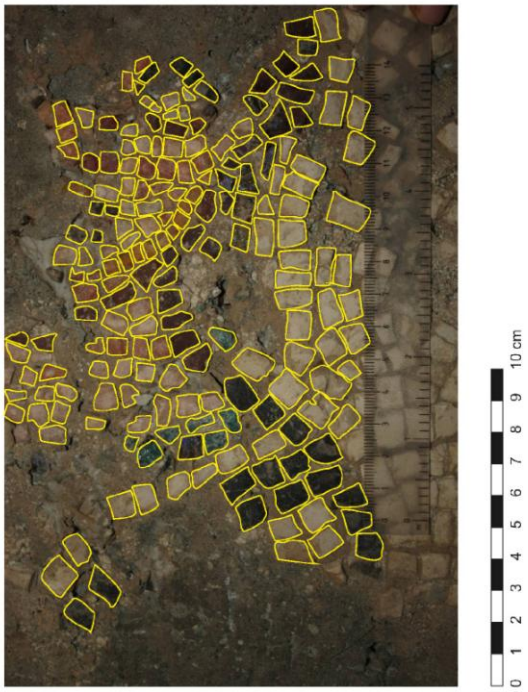
P00 No0530(T05) C
MUNSELL
1.3 YR 4.7/ 3.8

P00 No0530(T05) C
L a b
41.79 11.72 10.28



Density	80-100 T/dm^2
Mosaic Patterns and descriptions	Figure (1m) animals
Comment/Explanations	In inventory reports it is mentioned that mosaic has geometric borders around it. However currently it does not exist. Özgüç does not mention it as well. According to Salman mosaic is depicting the sacrifice of Ishmael son of Prophet Ibrahim. Style is close to Edessa mosaics (unreal position of the figures feet, animals illustrated on top of each other points out there was no concern for depth and content.
Bibliography	Bingöl, 2013; Özgüç, 1985; Salman, 2007
Drawings/ Photos	

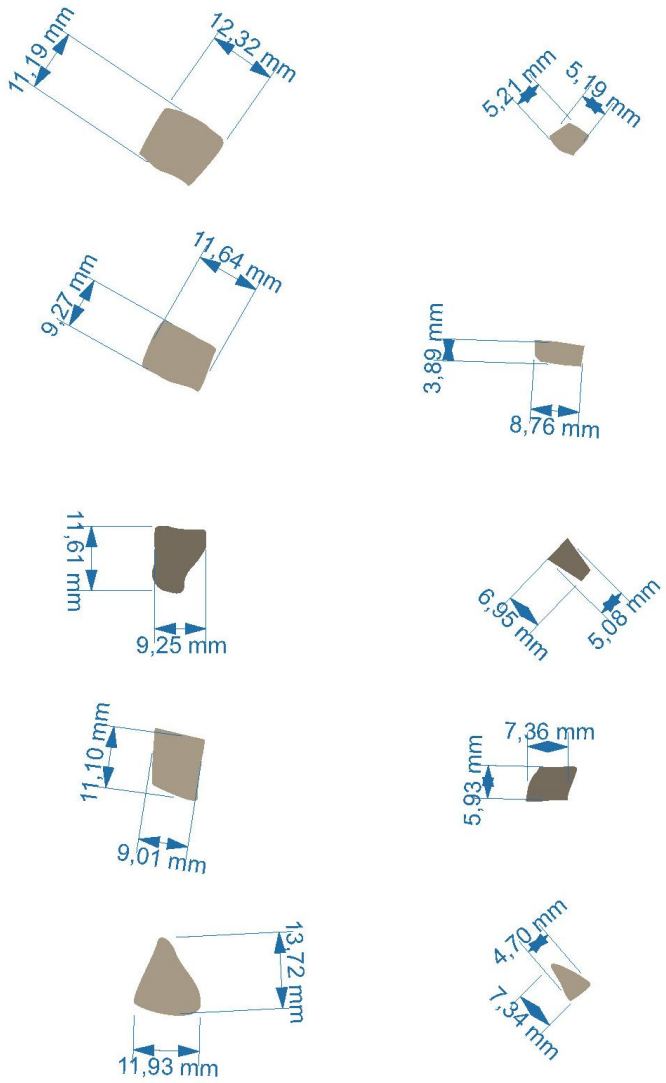

0 1 2 3 4 5 6 7 8 9 10 cm


0 1 2 3 4 5 6 7 8 9 10 cm

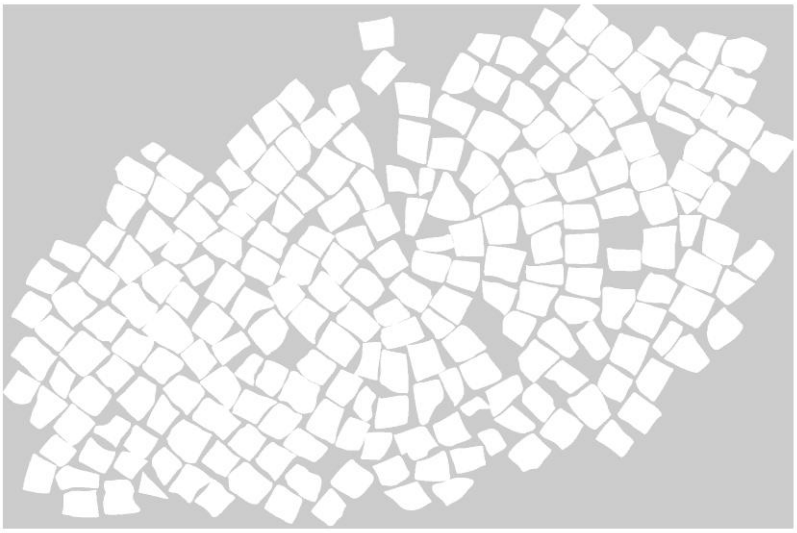
Name of the Mosaic	**Perrhe Mosaic 1**
Corpus Number	7
Origin of the mosaic or the Archeological Settlement	Perrhe (Exc.)
Function of the Space	Unknown
Excavation Date	Not recorded
Period	3-6th Centuries AD
Current location and Protection Status of the Mosaic	Adıyaman Museum's archive
Size of the mosaic (in meters)	Only a part of the whole mosaic was obtained
Technique of the Mosaic	Opus vermiculatum
Tesserae Type	Cut Stone

Tesserae Size

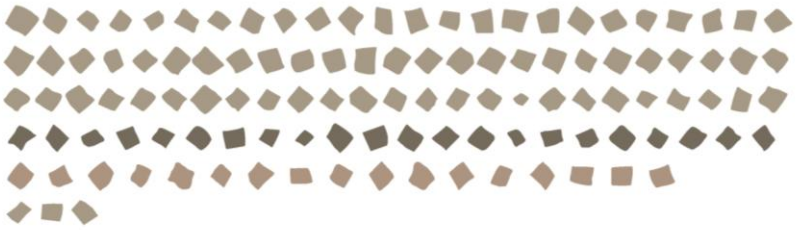
0,5-1 cm



Tesserae Shape

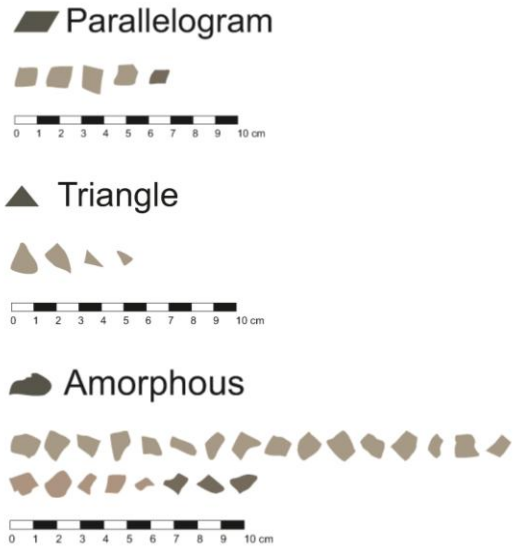


Square



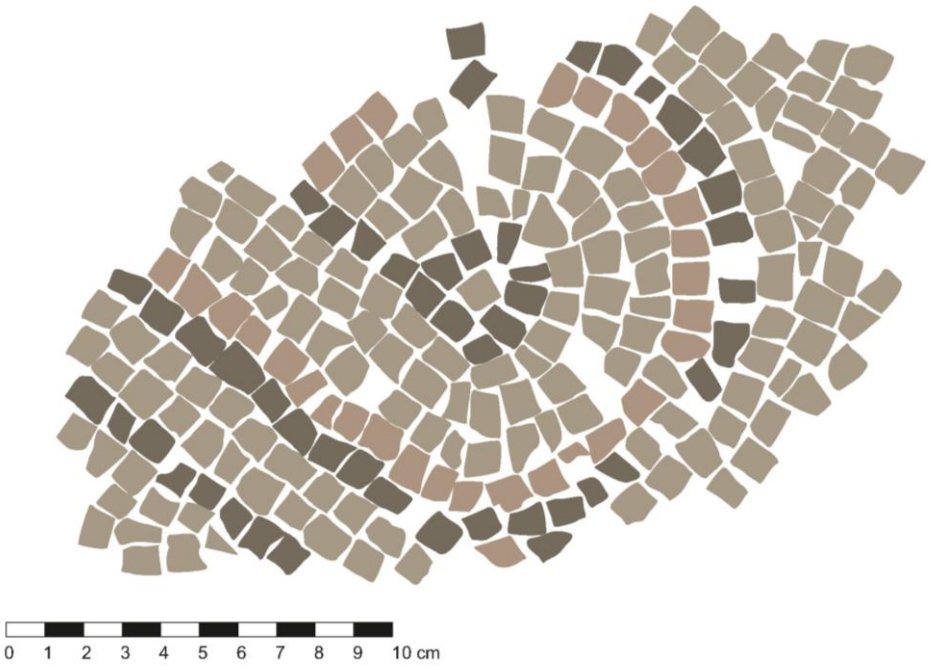
Rectangle

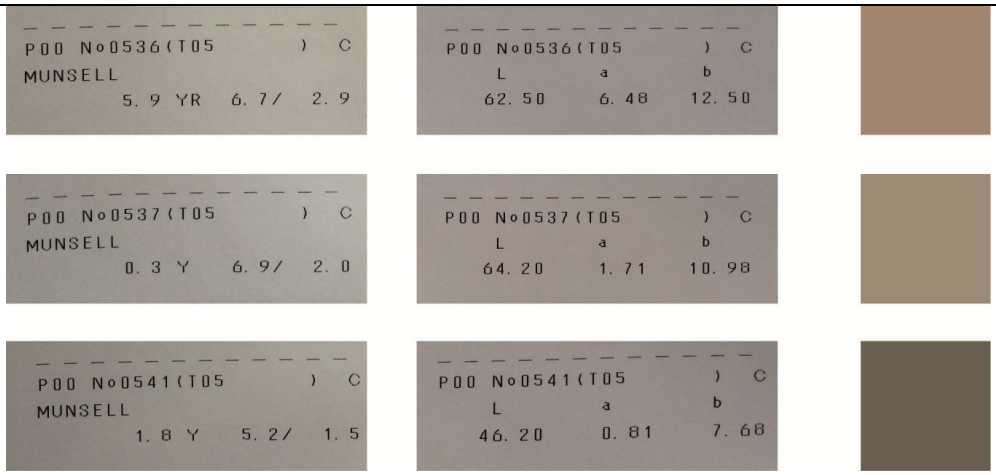
Trapezoid



% of tesserae : Square 49% Rectangle 25% Trapezoid 11% Parallelogram 2%
Triangle 1% Amorphous 10%

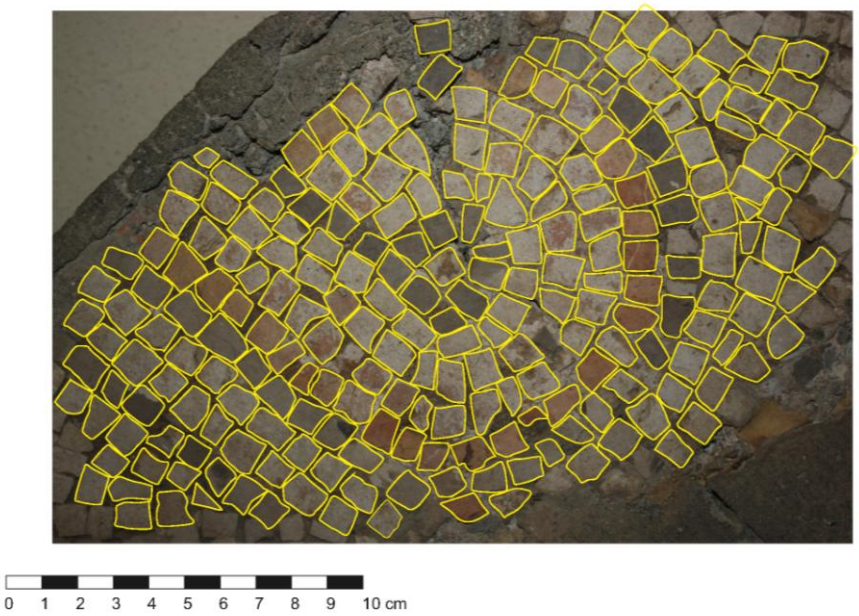
Tesserae colors





Density	95-105 T/dm^2
Mosaic Patterns and descriptions	Loop of a knot
Comment/Explanations	
Bibliography	Balmelle, et al., 1985

Drawings/ Photos

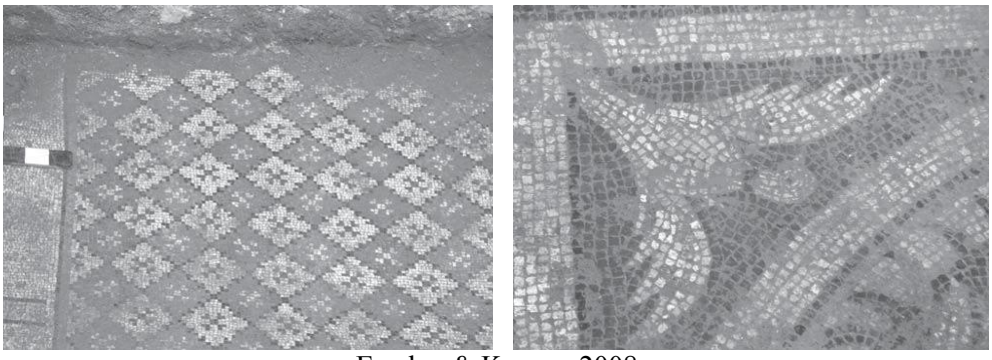


Another Commagene Region settlement Perrhe has mosaic examples both in Adıyaman Museum and in-situ. It was not possible to investigate in-situ mosaics due to the protection status therefore catalog was filled with information obtained from literature and museum authorities. However it should be noted that there were no records for the Perrhe mosaics in Adıyaman Museum archive. Thus, some information was derived from literature and mosaics were investigated and recorded as possible.

In Perrhe Mosaic 1 (Corpus No 7) a loop of a knot was investigated. Opus vermiculatum was used and mosaic includes three different colors. Tesserae size differs from 0, 3 to 1, 4 cm. Mosaic with Corpus no 11 is important where it contains a multi-strand guilloche, zigzag pattern and meander (Table 4.1). Mosaic is as colorful as Zeugma mosaics. This mosaic is promising considering the fact that there are still mosaics underground haven't brought to light in Perrhe. Corpus No 8 and 9 contain colorful geometric mosaics with advanced borders can be only some of the mosaics Perrhe produced. As there are some mosaics signed as "Zosimos" from Samosata, in Zeugma collection, may lead to there were masters in Samosata, and also there might be exquisite examples of Roman Period mosaics in Perrhe.

Name of the Mosaic	**Perrhe Mosaics In-situ A**
Corpus Number	8
Origin of the mosaic or the Archeological Settlement	Perrhe, Villa with Mosaics
Function of the Space	Room A
Excavation Date	2006
Period	2nd Cent AD
Current location and Protection Status of the Mosaic	In-situ
Size of the mosaic (in meters)	4.80 x 5.15 m
Technique of the Mosaic	Opus tessellatum and opus vermiculatum
Tesserae Type	Cut Stone
Tesserae Size	
Tesserae Shape	
Tesserae colors	Black, white, blue, red
Density	
Mosaic Patterns and descriptions	Equilateral quadrangles, meander, guilloche, floral motifs and geometric figures around central panel
Comment/Explanations	Central part of the mosaic has bird figures around the corners and either destroyed or removed by smugglers
Bibliography	Salman, 2007; Eraslan & Karaca, 2008

Drawings/ Photos



Eraslan & Karaca, 2008

Salman, 2007

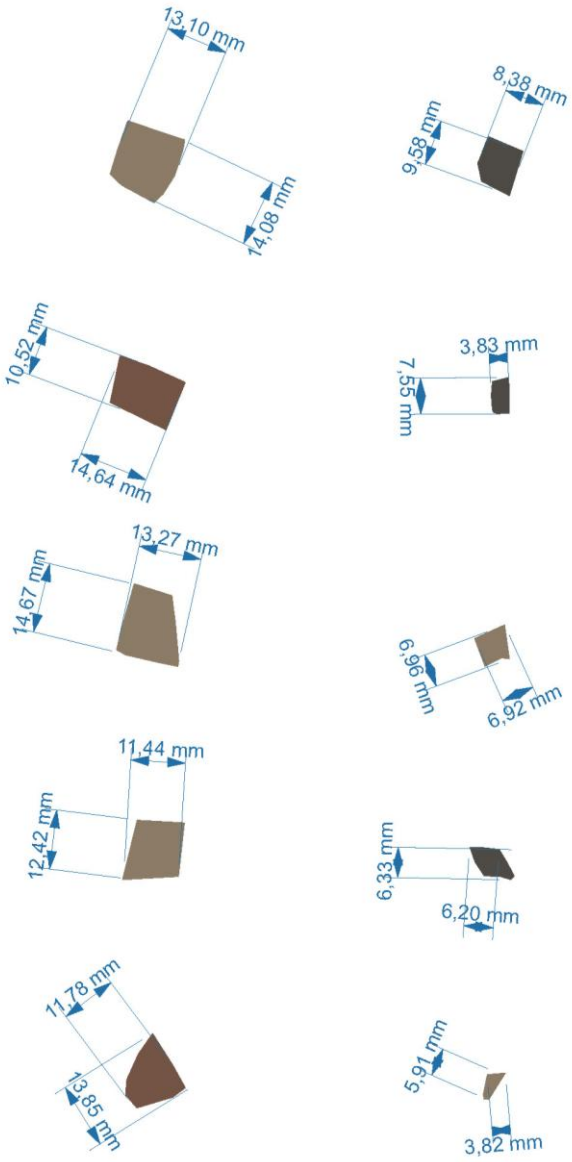
Name of the Mosaic	**Perrhe Mosaic s In-Situ B**
Corpus Number	9
Origin of the mosaic or the Archeological Settlement	Perrhe, Villa with Mosaics
Function of the Space	Room B
Excavation Date	2006
Period	Roman Period, 2 Cent AD
Current location and Protection Status of the Mosaic	In-situ
Size of the mosaic (in meters)	4.27 x 4.00 m
Technique of the Mosaic	Opus tessellatum and opus vermiculatum
Tesserae Type	Cut Stone
Tesserae Size	
Tesserae Shape	
Tesserae colors	Black, white, red and blue
Density	
Mosaic Patterns and descriptions	Geometric and floral motifs
Comment/Explanations	
Bibliography	Eraslan & Karaca, 2008

Drawings/ Photos

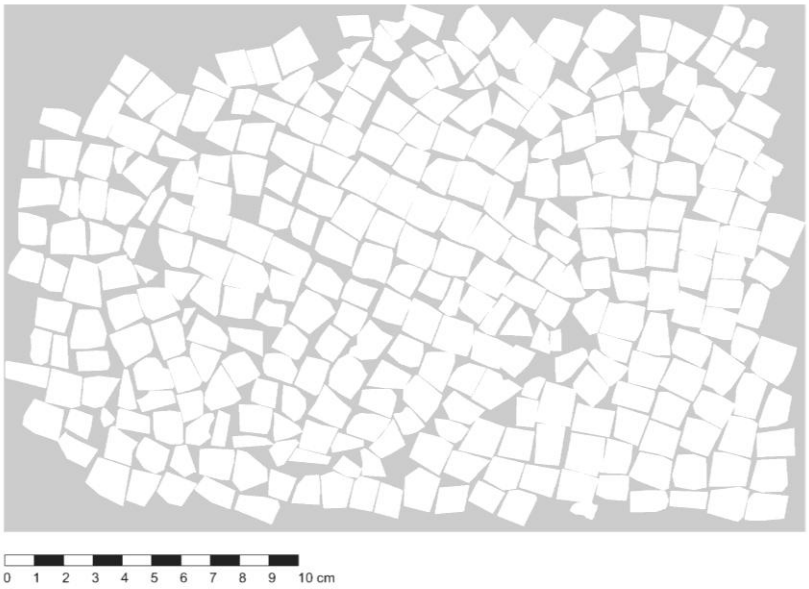
Eraslan & Karaca, 2008

Name of the Mosaic	**Ellipse Mosaic**
Corpus Number	10
Origin of the mosaic or the Archeological Settlement	Perrhe, building with an apse
Function of the Space	Unknown
Excavation Date	Not recorded
Period	3-6th Centuries AD
Current location and Protection Status of the Mosaic	Adıyaman Museum's archive
Size of the mosaic (in meters)	3.15 x 1.60 m
Technique of the Mosaic	Opus tessellatum and opus vermiculatum
Tesserae Type	Cut Stone

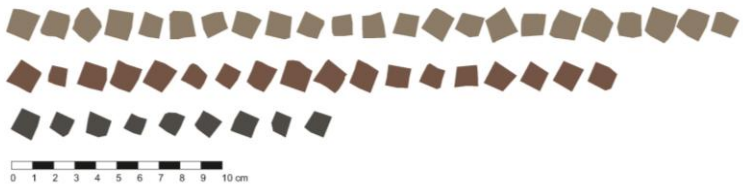
Tesserae Size



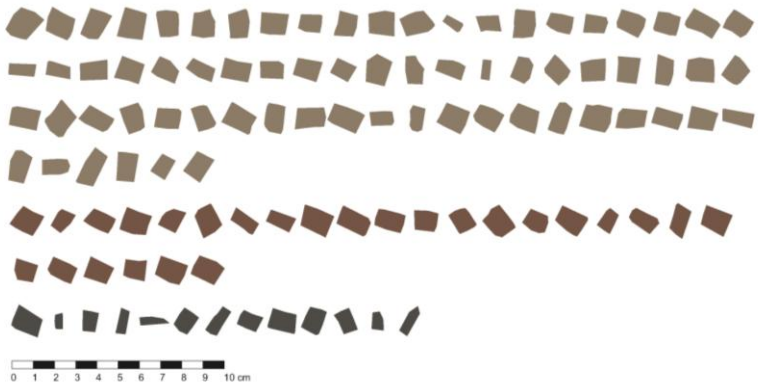
Tesserae Shape



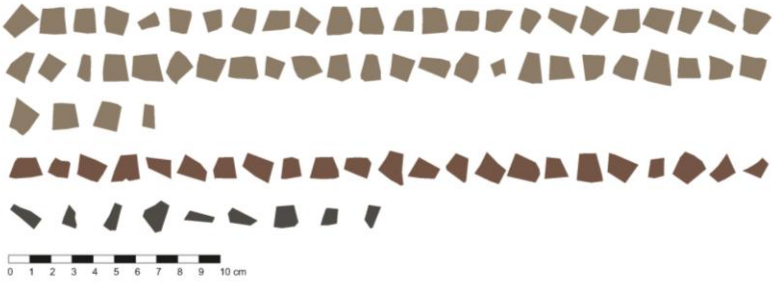
Square

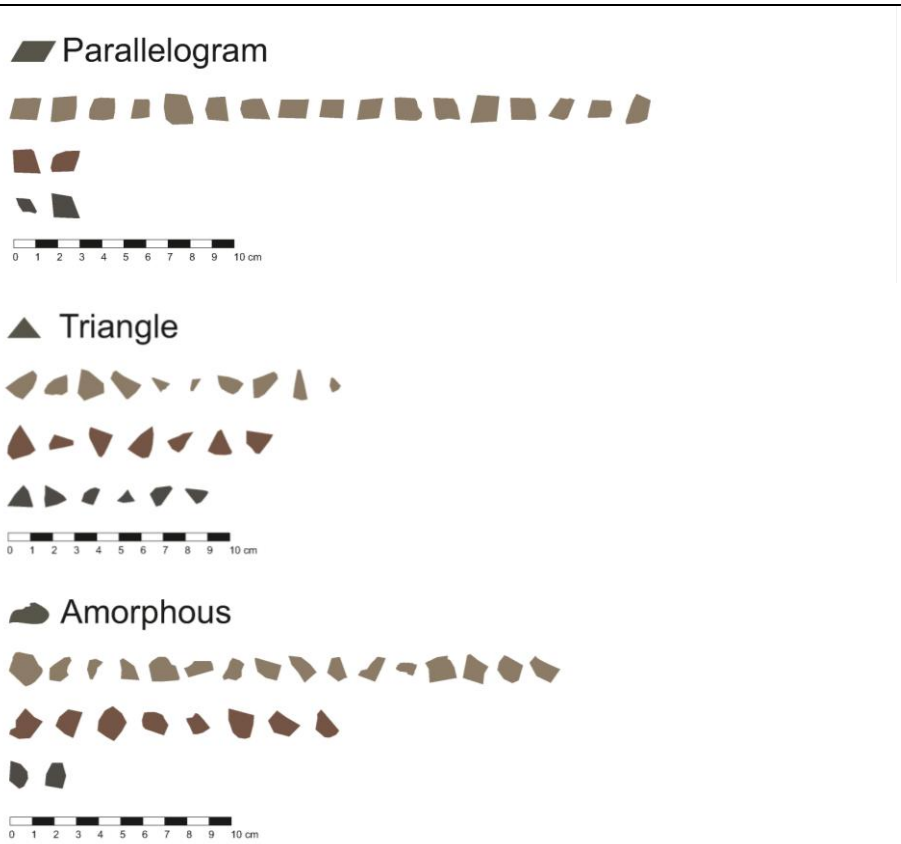


Rectangle



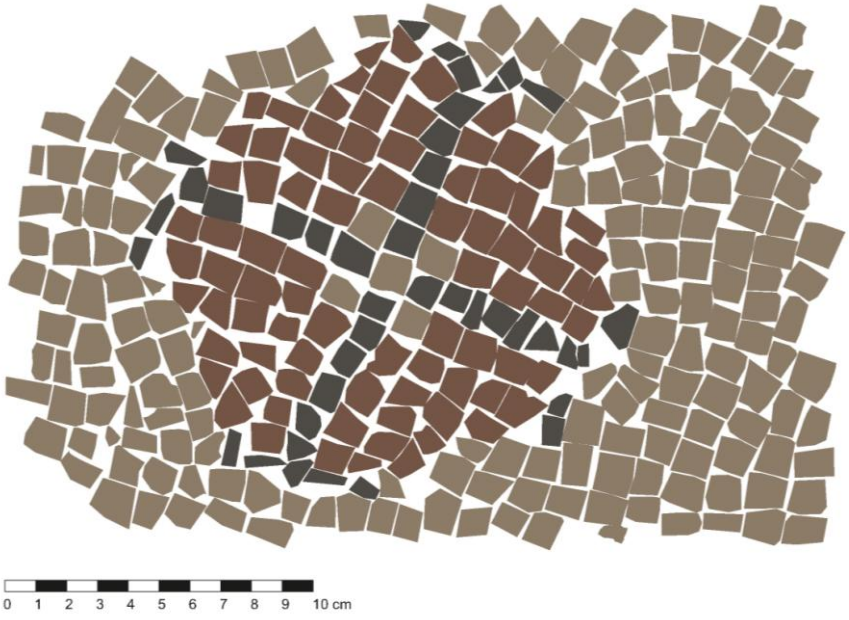
Trapezoid

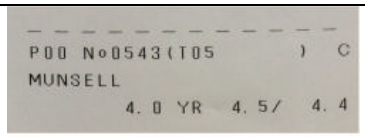


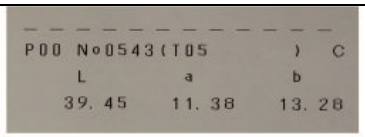


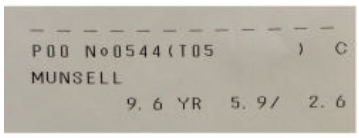
% of tesserae : Square 16% Rectangle 34% Trapezoid 26% Parallelogram 6% Triangle 7% Amorphous 8%

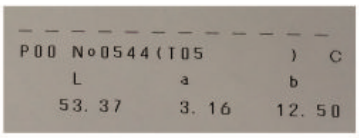
Tesserae colors

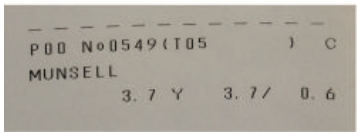


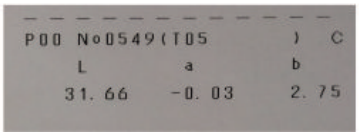






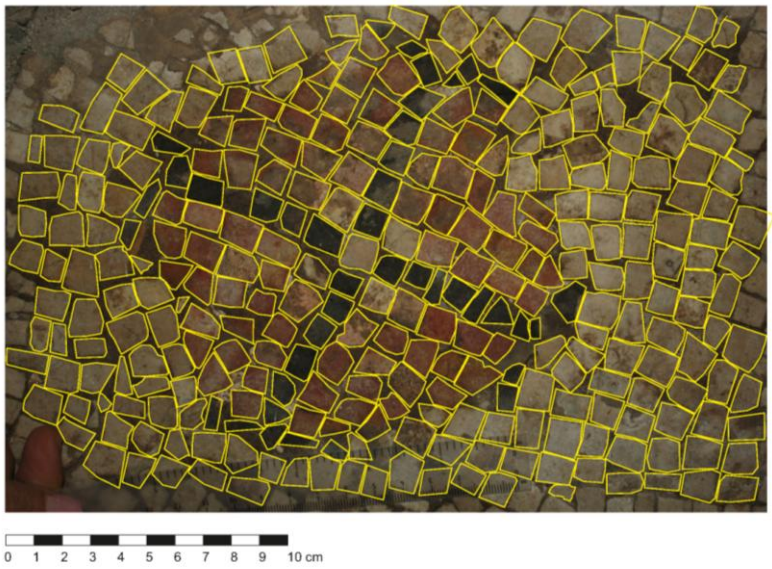






Density	70-100 T/dm^2
Mosaic Patterns and descriptions	Rosette
Comment/Explanations	Mosaic contains animal figures which are illustrated with a double line of tesserae contours and multi-colored. There was no border. However rosettes were used as motif in background as a renovated Roman form of the rosette used in Hellenistic era of Olynthus and Corinth mosaics.
Bibliography	Salman, 2007

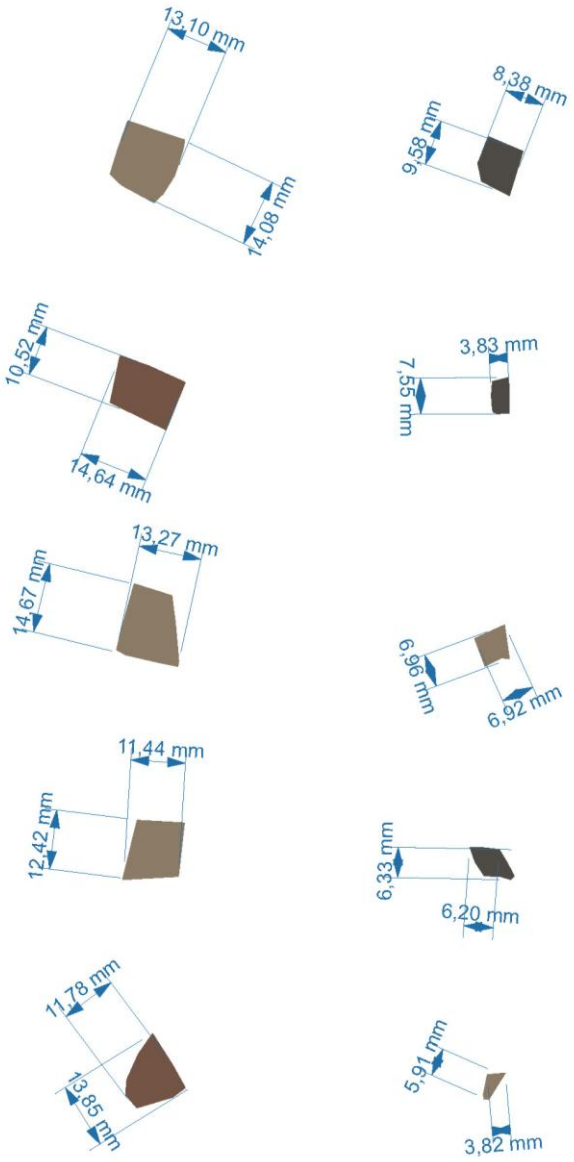
Drawings/ Photos



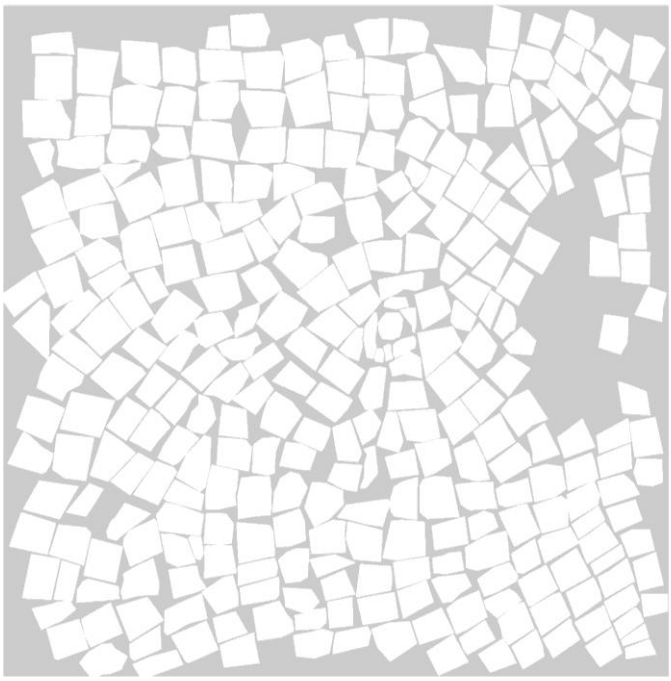
Whole Mosaic (Salman, 2007)

Name of the Mosaic	**Ellipse Mosaic**
Corpus Number	10a
Origin of the mosaic or the Archeological Settlement	Perrhe, building with an apse
Function of the Space	Unknown
Excavation Date	
Period	3-6th Centuries AD
Current location and Protection Status of the Mosaic	Adıyaman Museum's archive
Size of the mosaic (in meters)	3.15 x 1.60 m
Technique of the Mosaic	Opus tessellatum and opus vermiculatum
Tesserae Type	Cut Stone

Tesserae Size

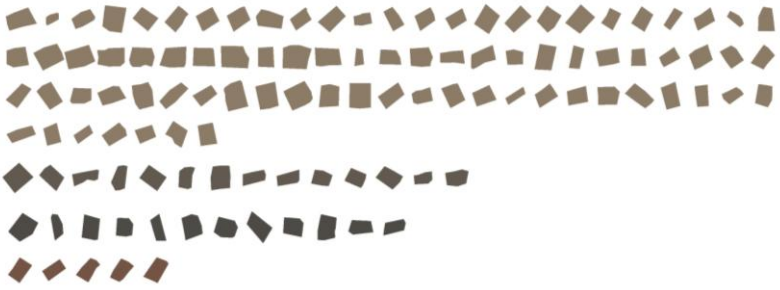


Tesserae Shape

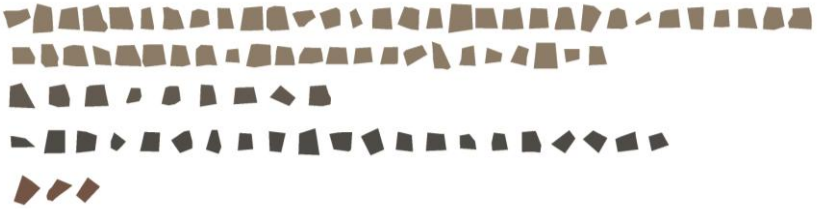


Square

Rectangle

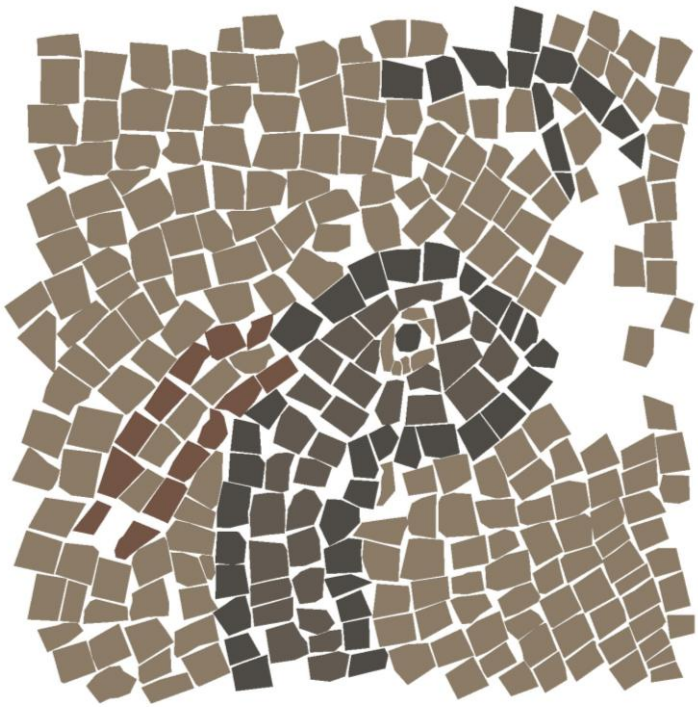


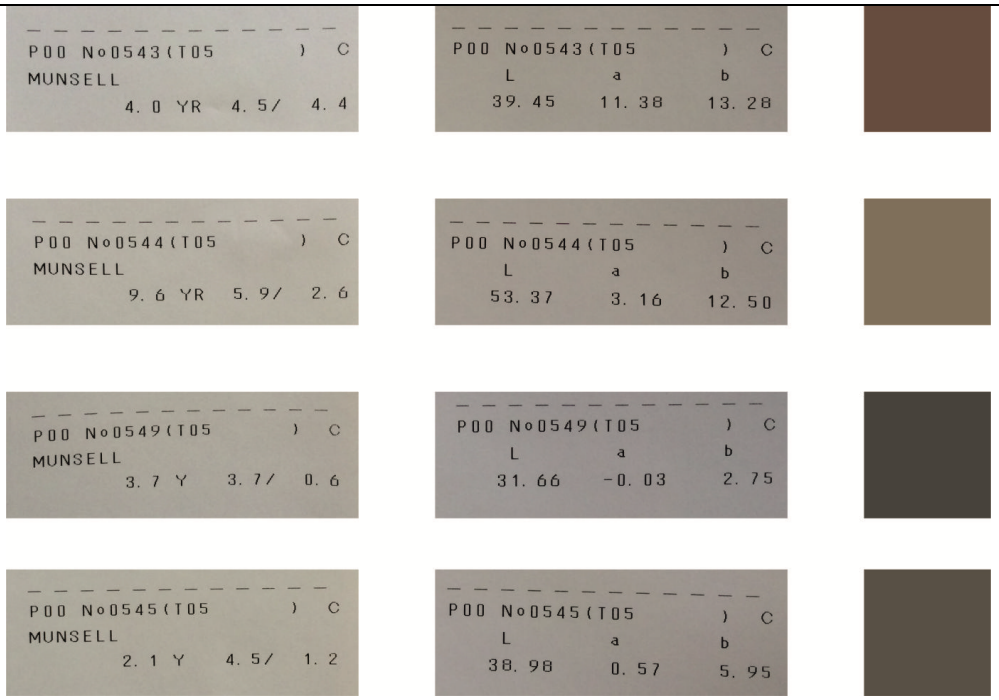
Trapezoid



% of tesserae : Square 9% Rectangle 36% Trapezoid 28% Parallelogram 13%
Triangle 3% Amorphous 8%

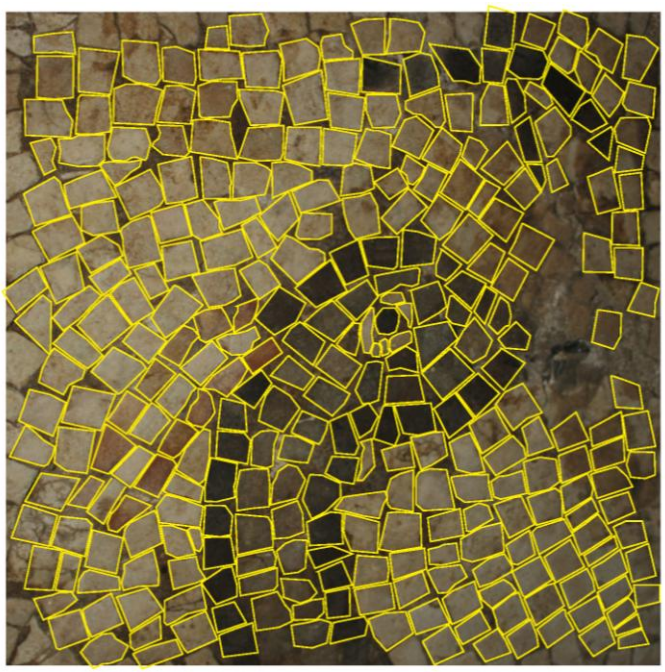
Tesserae colors





Density	70-100 T/dm^2
Mosaic Patterns and descriptions	Rosette and animals
Comment/Explanations	In this part of the mosaic, due to the fact that no scale was used, tesserae were presented without a scale below them. However size is same with the part given in Corpus 10a. here only the shape of the tesserae in bird and colors are given.
Bibliography	Salman, 2007

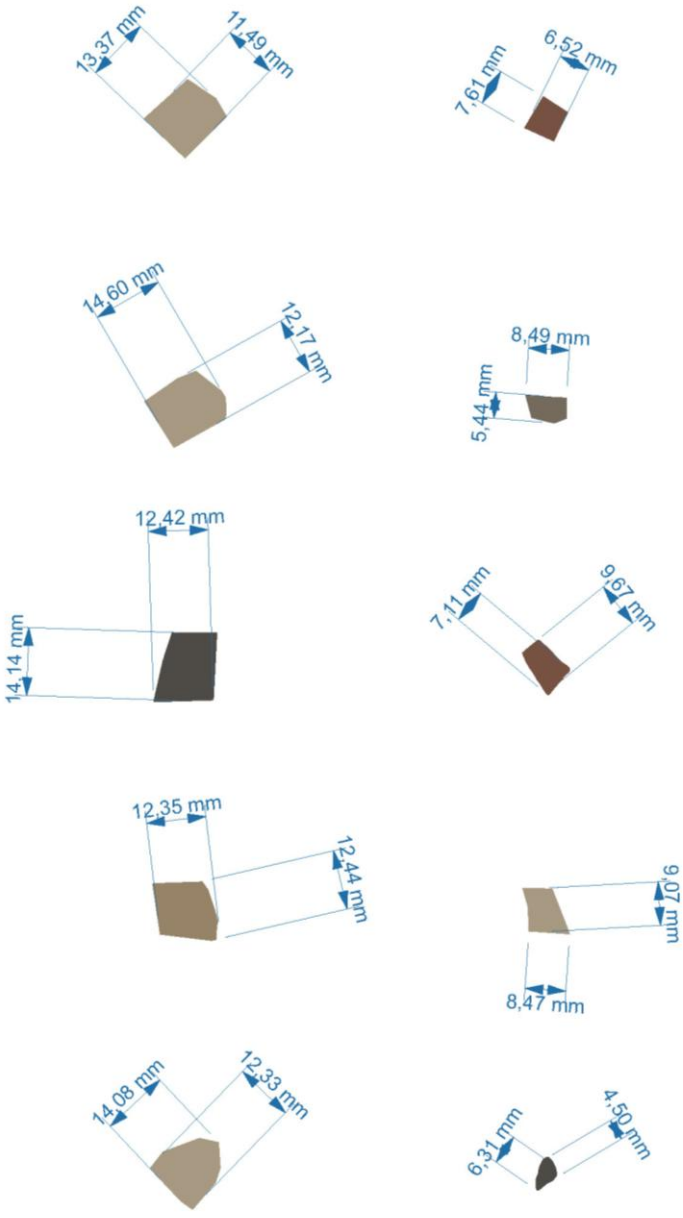
Drawings/ Photos



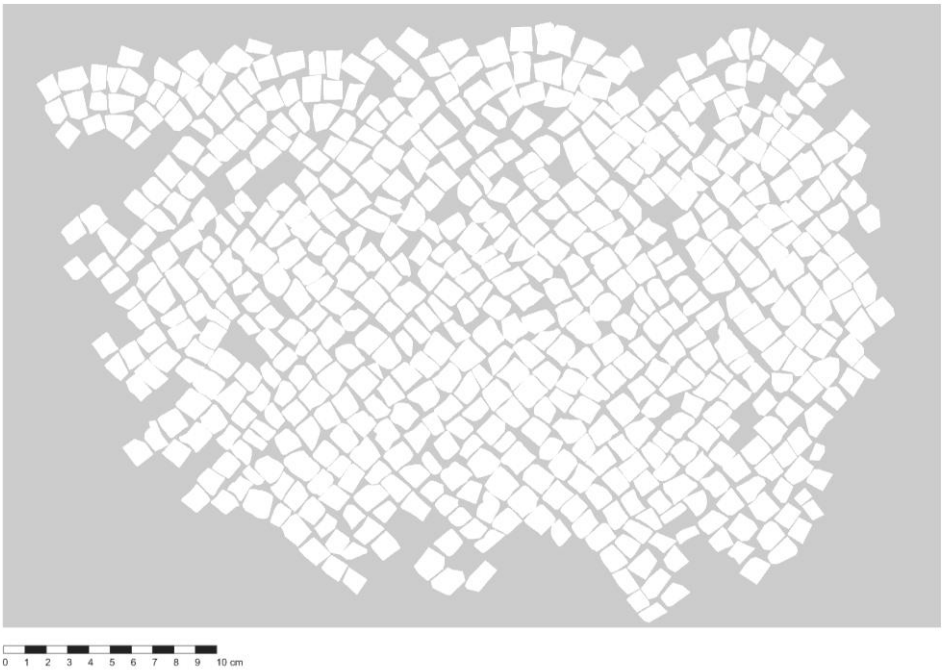
Geometric and animal figures are mostly seen in Perrhe mosaics. Mosaics are colorful and made with opus tessellatum in background and opus vermiculatum in figurative and geometrical parts. In Ellipse Mosaic there are no borders, only rosette is used to fill the background adopted from Hellenistic Period (Corpus No 10 and 10a). Mosaic 10a includes a bird figure though only investigated for color and tesserae shape, since scale was not used in this part of the mosaic. Tesserae size left blank though; it can be considered same size with the mosaic presented in Corpus No 10, since both areas belong to same apse mosaic where tesserae sizes are identical.

Name of the Mosaic	**Perrhe Mosaic 2**
Corpus Number	11
Origin of the mosaic or the Archeological Settlement	Perrhe
Function of the Space	Unknown
Excavation Date	Not recorded
Period	3-6th Centuries AD
Current location and Protection Status of the Mosaic	Adıyaman Museum Archive
Size of the mosaic (in meters)	Only partially obtained
Technique of the Mosaic	Opus tessellatum and opus vermiculatum
Tesserae Type	Cut Stone

Tesserae Size

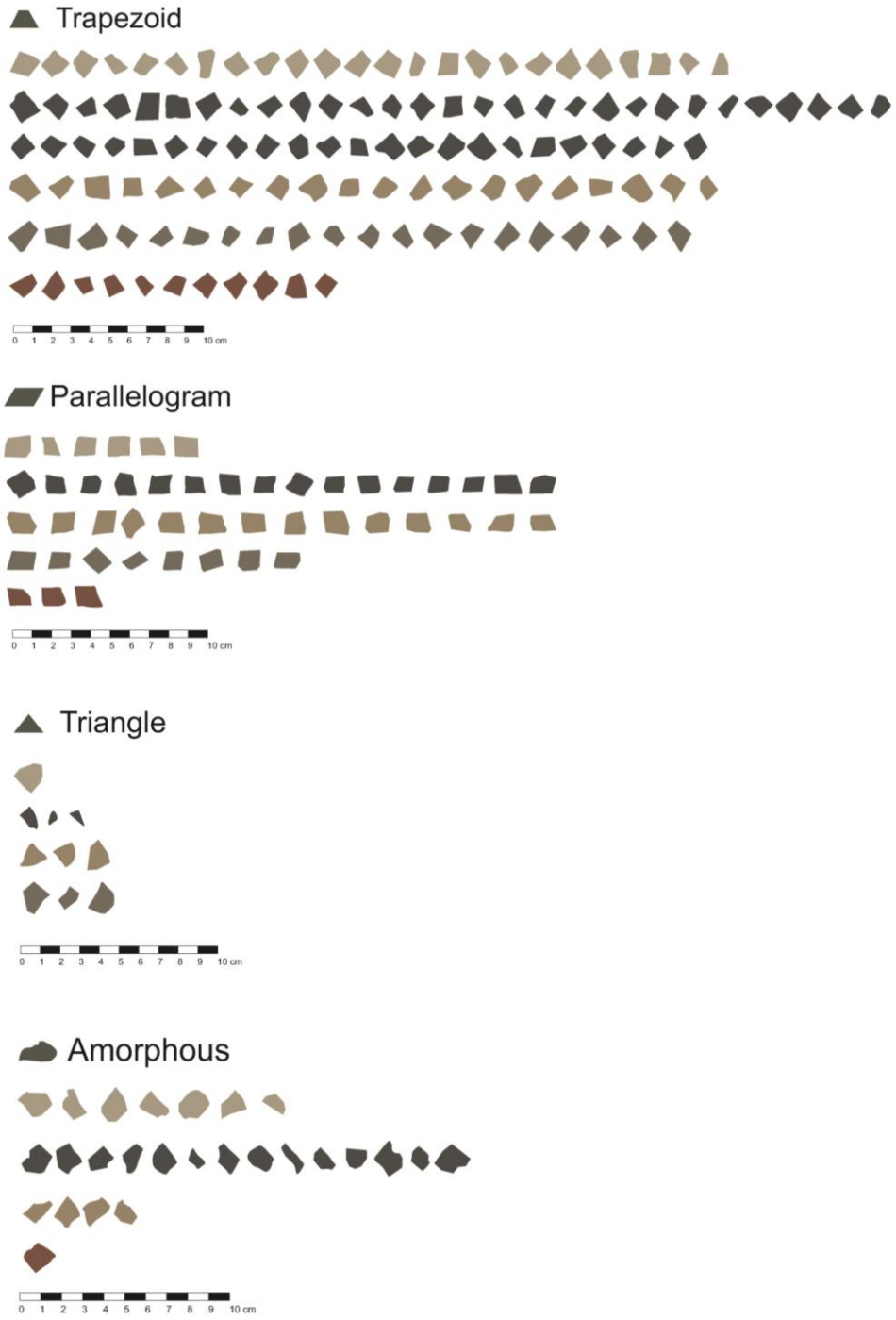


Tesserae Shape



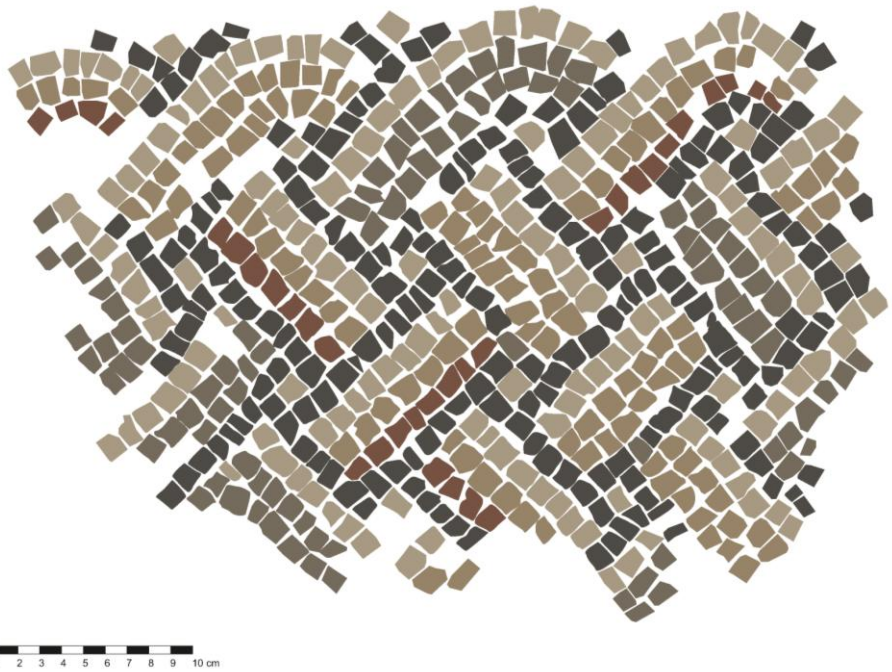
Square

Rectangle



% of tesserae : Square 21% Rectangle 43% Trapezoid 21% Parallelogram 7%
Triangle 1% Amorphous 4%

Tesserae colors White, black, red, blue, yellow



P00 No0538(T05) C
MUNSELL
3.0 YR 4.5/ 5.0

P00 No0538(T05) C
L a b
39.48 14.01 14.01

P00 No0539(T05) C
MUNSELL
6.7 YR 6.1/ 2.8

P00 No0539(T05) C
L a b
56.26 5.78 11.91

P00 No0540(T05) C
MUNSELL
0.4 Y 6.9/ 2.4

P00 No0540(T05) C
L a b
64.44 2.08 13.21

P00 No0541(T05) C
MUNSELL
1.8 Y 5.2/ 1.5

P00 No0541(T05) C
L a b
46.20 0.81 7.68

P00 No0542(T05) C
MUNSELL
0.5 Y 6.1/ 3.6

P00 No0542(T05) C
L a b
55.64 3.21 16.81

P00 No0549(T05) C
MUNSELL
3.7 Y 3.7/ 0.6

P00 No0549(T05) C
L a b
31.66 -0.03 2.75

Density	75-85 T/dm^2
Mosaic Patterns and descriptions	Multi-strand Guilloche, Meander, zigzag motif
Comment/Explanations	
Bibliography	Salman, 2007

Drawings/ Photos

(Salman, 2007)

Bahasna Mosaics 1 and 2 are investigated with corpus no 12 and 13 in the catalog. Salman (2007) has managed to photograph them in Adıyaman Museum's archive however in this study mosaics were not attainable. Therefore related information were taken from literature (Yener, 1993; Salman, 2007). Mosaics were multicolored with geometrical motifs including intersecting circles of four spindles, and adjacent octagons forming squares in center (Corpus no 12). This motif is similar to one mosaic unearthed in Zeugma (Figure 4.1). Mosaic with Corpus number 13 had meander motifs. Meander is one of the most reiterated motif used in Commagene Region in all regions and periods (Table 4.1). Bahasna mosaics were excavated in 1991-92 and dated to late Roman Period. Mosaics were found in a house in Haraba village, and investigations showed that the area it covered was larger than the house but mosaic was highly damaged. According to (Yener, 1993) it may possibly belonged to a church. These mosaics were only recorded mosaics of Bahasna and important for mosaic documentation though detailed analysis and color detection could not be done due to museum archive conditions.

Figure 4.1 Floor of the room with an apse with geometrical patterns (Ergeç, 2007)

Name of the Mosaic	**Bahasna Mosaic 1**
Corpus Number	12
Origin of the mosaic or the Archeological Settlement	Bahasna, Haraba village, 5336 inventor no
Function of the Space	Unknown, church (04. Museum Salvation)
Excavation Date	1991-92 Museum salvage excavations
Period	Late Roman Period, 6^{th} – 7^{th} AD
Current location and Protection Status of the Mosaic	Adıyaman Museum's Archive
Size of the mosaic (in meters)	Secured only partially, unknown
Technique of the Mosaic	Opus Tessellatum , opus vermiculatum
Tesserae Type	Cut Stone
Tesserae Size	1-2 cm
Tesserae Shape	
Tesserae colors	White, brown, yellow, black, burgundy, blue
Density	55-75 T/dm^2
Mosaic Patterns and descriptions	Intersecting circles with concave squares inside, adjacent octagons forming squares, equilateral quadrangles
Comment/Explanations	
Bibliography	Yener, 1993; Salman, 2007; Balmelle, et al., 1985

Drawings/ Photos

(Salman, 2007)

Name **of the Mosaic**	**Bahasna Mosaic 2**
Corpus Number	13
Origin of the mosaic or the Archeological Settlement	Bahasna, Haraba village, 5337 inventory no
Function of the Space	Unknown
Excavation Date	1991-92 Museum salvage excavations
Period	Late Roman Period, 6^{th} – 7^{th} AD
Current location and Protection Status of the Mosaic	Adıyaman Museum's Archive
Size of the mosaic (in meters)	Secured only partially, unknown
Technique of the Mosaic	Opus Tessellatum
Tesserae Type	Cut stone
Tesserae Size	1-2 cm
Tesserae Shape	
Tesserae colors	White, red, blue, green
Density	55-75 T/dm^2
Mosaic Patterns and descriptions	Meander
Comment/Explanations	
Bibliography	Yener, 1993; Salman, 2007

Drawings/ Photos

(Salman, 2007)

Zeugma collection includes numerous mosaics in exhibition and only the ones with the deity Dionysus were selected because quantification of this collection was beyond the limits of this study due to region's varietal richness. There were seven mosaics depicting the deity, two of them were exhibited on floor and rest was on walls. The Honeymoon of Dionysus and Ariadne, and Return of Dionysus from India were located on the floor, thus; measurements could not be done properly. Former mosaic was close enough to capture it with devices though it was not possible to measure the color values as one had to walk on the mosaic to reach its tesserae. Latter one was only completely visible from mezzanine floors. Lenses were not enough to capture tesserae shapes for analysis from that distance. Photographs from museum authorities was not detailed enough to draw tesserae shapes as well. Hence these two mosaics were presented with missing information in catalog (Corpus No 15 and 19).

Dionysus mosaic (Corpus No 14) is floor mosaic of Oceanus Villa depicted along three panels. First panel depicts "Maenad Head" from the corridor mosaic of the Maenad Villa (Ergeç, 2007, Figure 4.2)[1].

Figure 4.2 Maenad Head (from O. Dolaş's archive)

[1] In some internet sources and popular magazines this mosaic was stated as "Bust of Dionysus". However it does not carry the specific features of Dionysus including his halo and diadem; in addition its facial features are different.

Middle panel is “Meeting of Dionysus and Ariadne” (Corpus No 14) that represents Dionysus finding Ariadne in Naxos Island where they got married (Figure 4.3). Panel also describes Silenos and The deity Pan who both have been in the cortege of Dionysus. Most of the mosaic panel is damaged. However heads of Dionysus and Ariadne under tree are still visible. Mosaic carries finest tesserae down to 0.2 mm.

Figure 4.3 Meeting of Dionysus and Ariadne (from O. Dolaş’s archive)

In this mosaic faces are depicted with significantly smaller tesserae compared to other forming the scene (255-275 T/dm^2 on face, 160-170 T/dm^2 on background). However still, there is shape classification of the tesserae only some were considered as amorphous. It should be mentioned, in this study, altered and deformed tesserae were considered amorphous, thus; those irregular shapes might belong to another classified group if their distortion was neglected. Density of this and all Zeugma mosaics investigated is significantly higher compared to Perrhe mosaics which might be accepted as a result of mastery. Only Dionysus Medallion shows lower rates of tesserae amount in Zeugma mosaics (Figure 4.4).

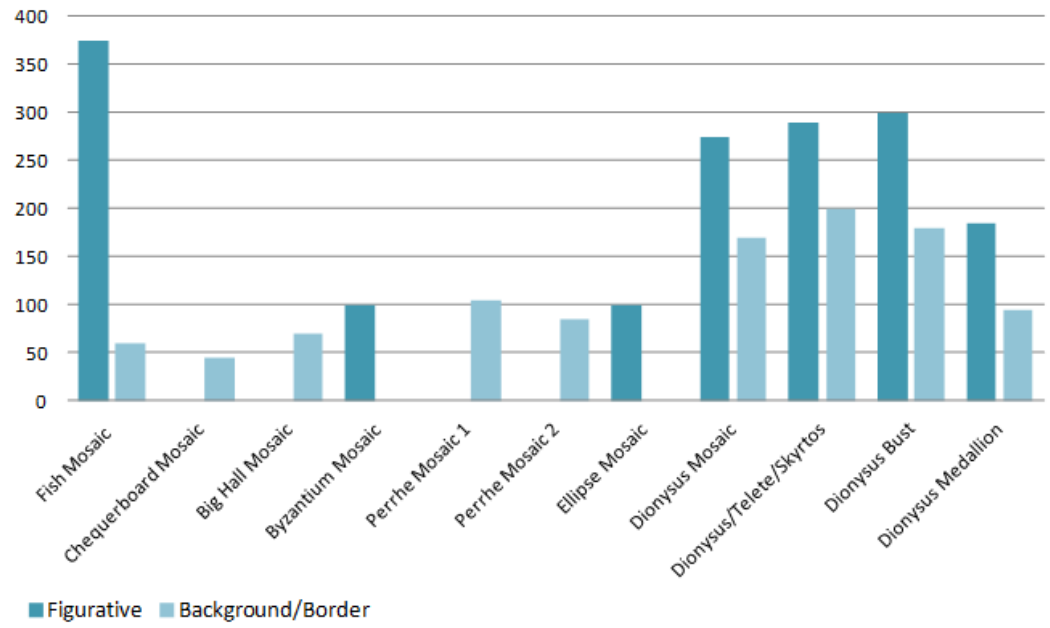


Figure 4.4 Densities of Mosaics

Density rates of mosaics were taken as parameter to compare mosaics from different periods in this study as it might be taken as indication of mastery. Therefore all mosaics from Commagene Region were investigated in the same diagram (Figure 4.4). All Zeugma mosaics investigated own tesserae more than 185 in figurative areas. Dionysus Bust carries almost 300 tesserae in its figurative part which is highest amount in Zeugma mosaics. Perrhe mosaics mostly obtained from border areas which may be a fact of low density rates though Ellipse Mosaic is from an apse of a building and still contains lower than 100 tesserae in dm^2. Samosata Mosaic with Fishes indicates highest rate of density among all mosaics. Its tesserae are smallest as well compared to all other mosaics (Figure 4.5). However the difference between border tesserae sizes and figural part's is slightly highest. Mosaic with Fishes' border's density is lowest following Chequerboard mosaic which was made for function instead of aesthetical concerns for Samosata Palace corridor. Therefore if tessera size is considered as an indication of fine work, borders was not an important part of design in Hellenistic Period Samosata; therefore artists showed their mastery in the central parts of these mosaics. Another point is to obtain a reliable comparison monochromatic and colored mosaic should be compared within each other. However in this study Chequerboard mosaic is only monochrome mosaic which was used in

Samosata Palace along with colored mosaics. There are also monochrome parts of Mosaic with Fishes investigated in the study; still it is a fact in the center of this mosaic artists used colored tesserae. Therefore monochrome/color was not taken as a factor during comparison. But, to have a better understanding and reliable evaluations mosaics were evaluated within groups of figurative (Figure 4.5) or texture/background (Figure 4.6) mosaics.

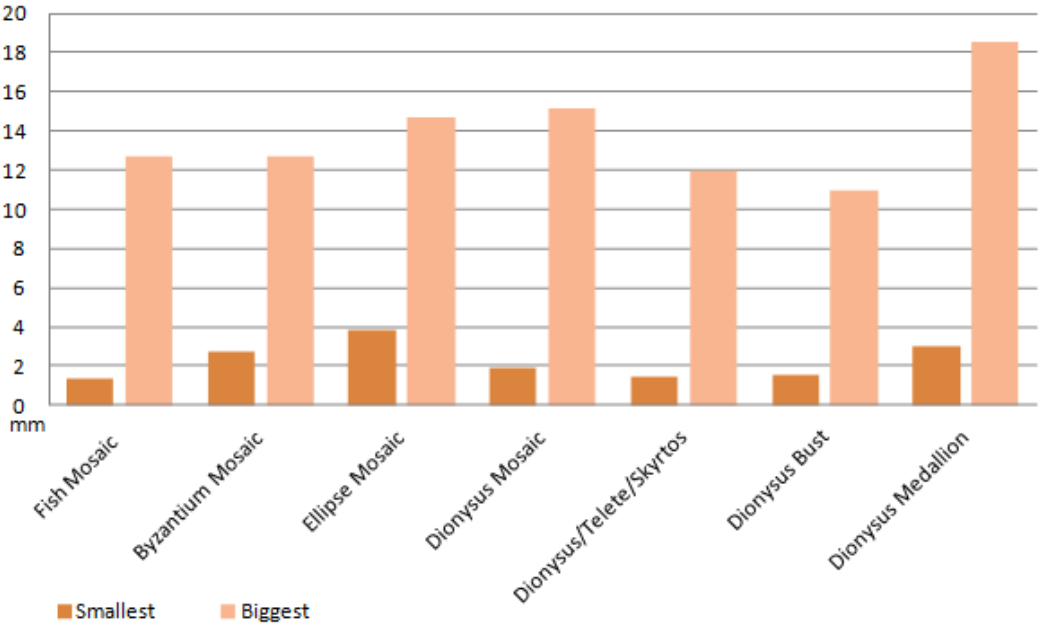


Figure 4.5 Smallest and Biggest tessera sizes of figurative mosaics

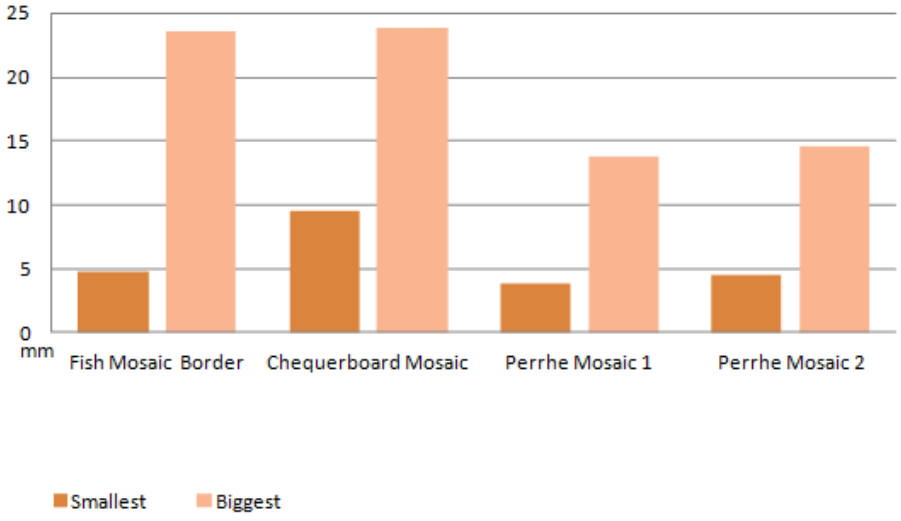
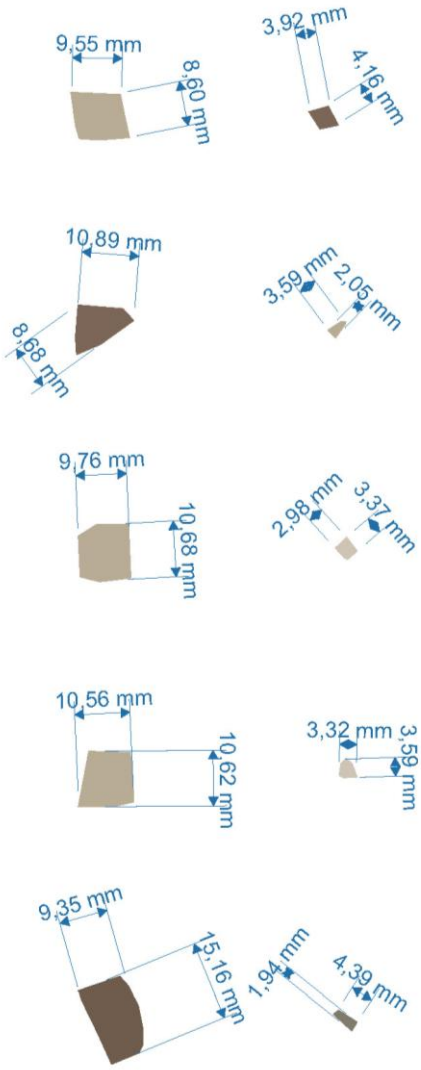


Figure 4.6 Smallest and Biggest tessera sizes of texture mosaics

Name of the Mosaic	**Dionysus Mosaic**
Corpus Number	14
Origin of the mosaic or the Archeological Settlement	Zeugma
Function of the Space	Oceanus villa
Excavation Date	1998 (Salvage excavations by Gaziantep museum)
Period	Roman Period (2-3 Cent AD)
Current location and Protection Status of the Mosaic	Zeugma Mosaic Museum, Exhibition Hall
Size of the mosaic (in meters)	0.35 x 0.70 m panel
Technique of the Mosaic	Opus tessellatum, opus vermiculatum
Tesserae Type	Cut Stone, Limestone

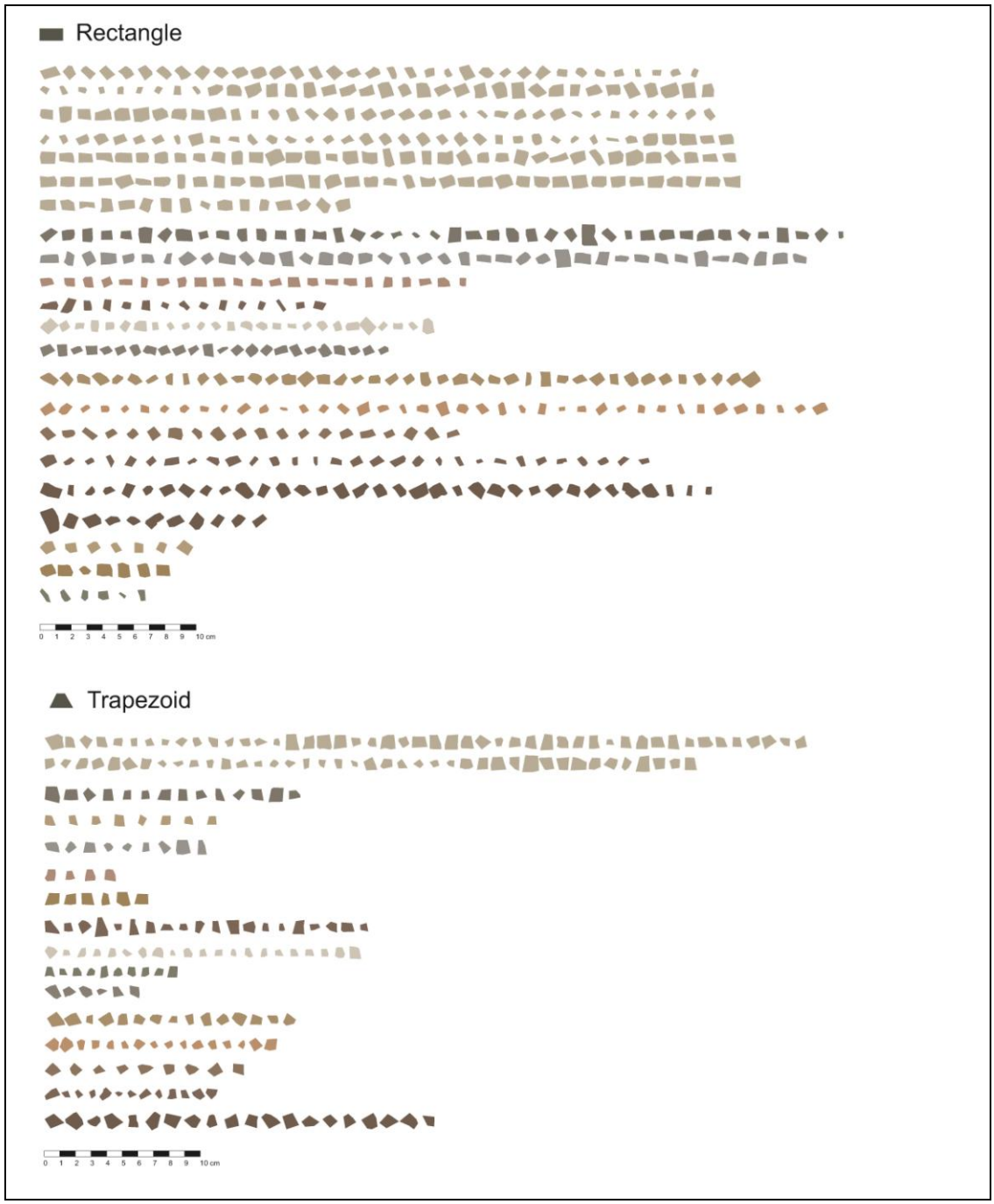
Tesserae Size (Biggest and smallest tesserae from each group)

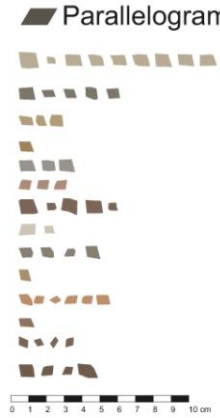
1cm x 1cm (border and background)

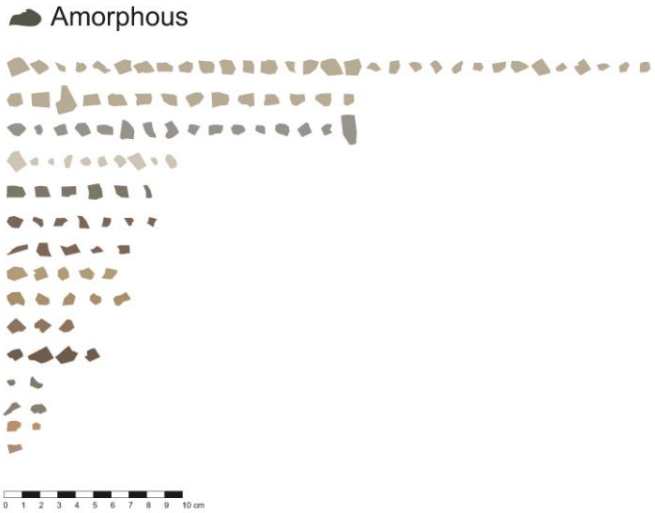


Tesserae Shape

Square

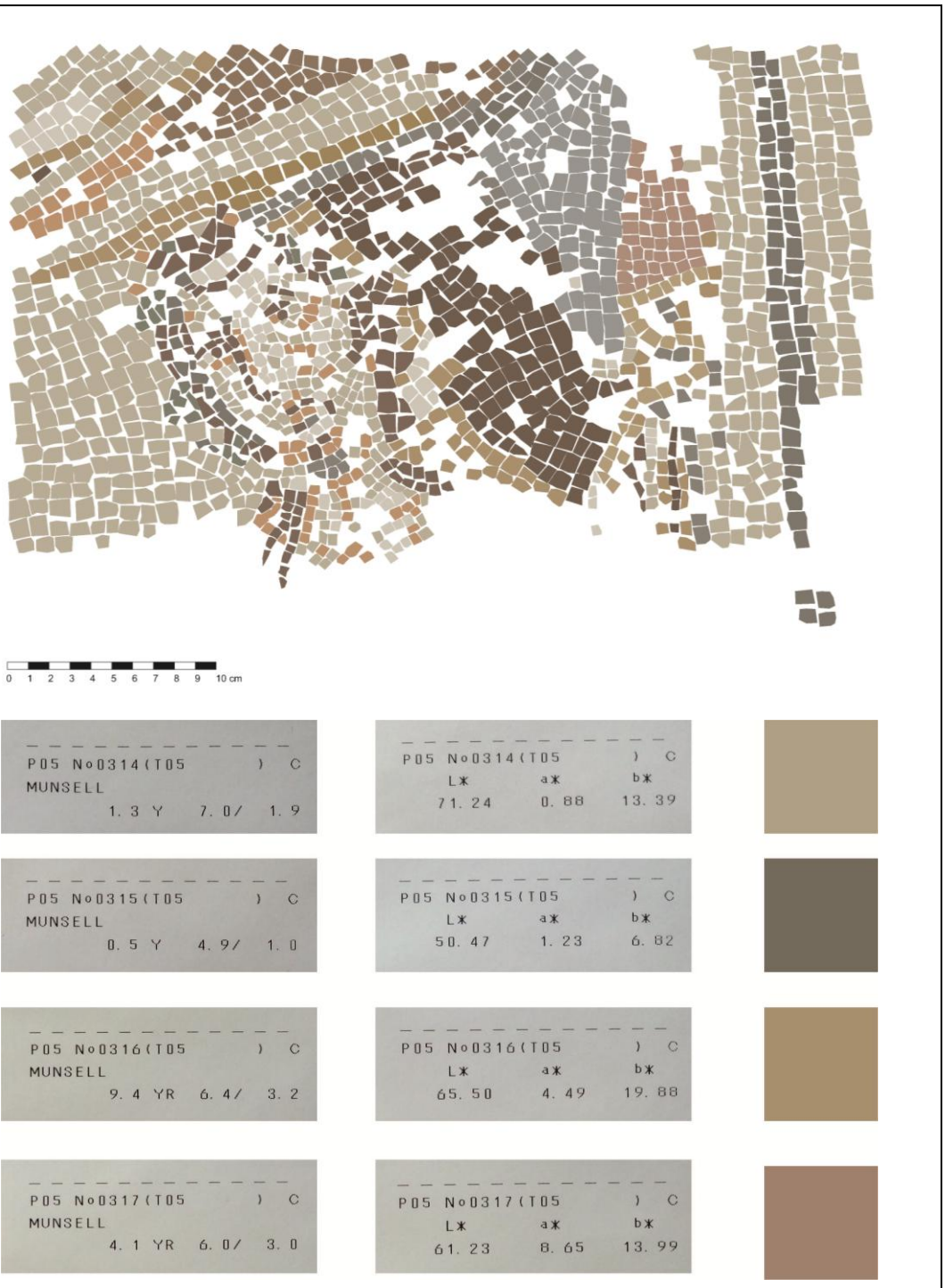

Rectangle
0 1 2 3 4 5 6 7 8 9 10 cm
Trapezoid
0 1 2 3 4 5 6 7 8 9 10 cm





% of tesserae : Square 23% Rectangle 41% Trapezoid 18% Parallelogram 4%
Triangle 4% Amorphous 7%

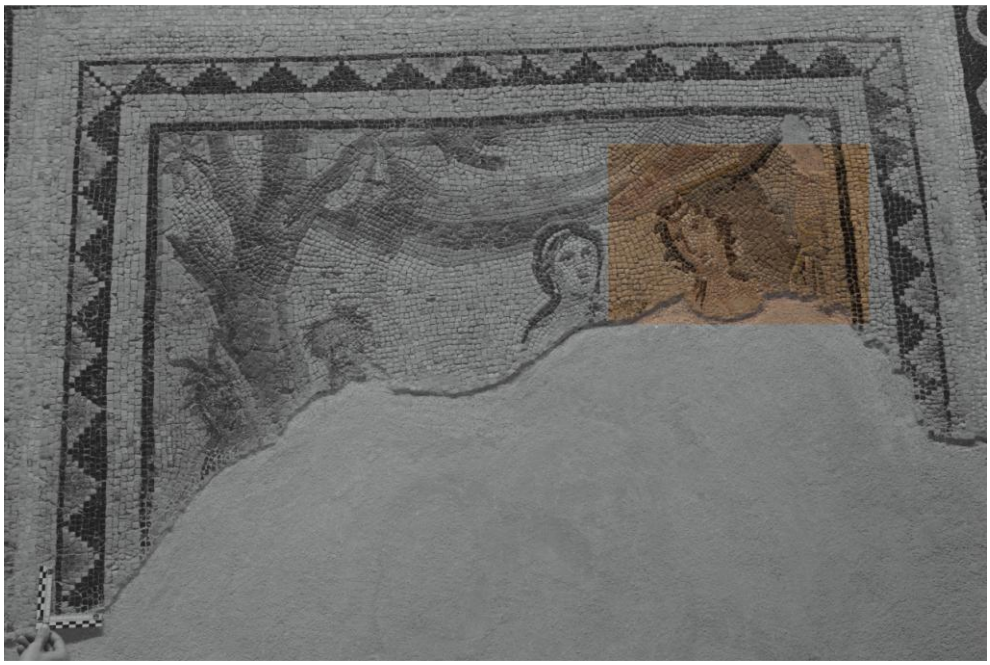
Tesserae colors White, cream, black, yellow, light pink, green; additionally in figures green, dark green, burgundy, blue, yellow, light violet, white, their tints and shades

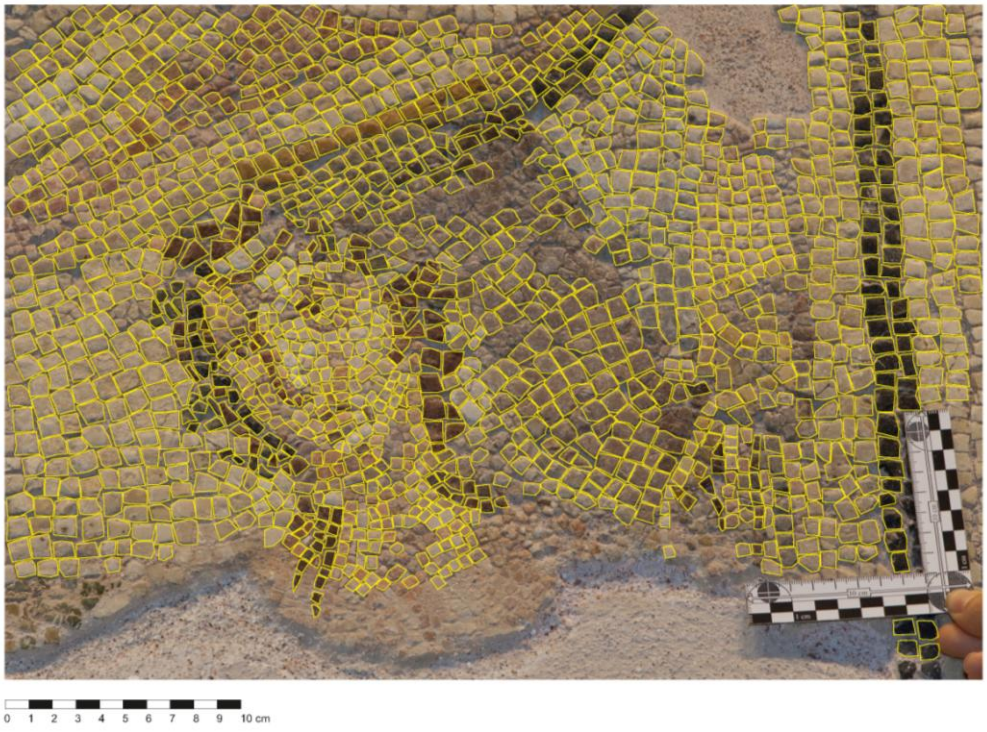

0 1 2 3 4 5 6 7 8 9 10cm
P05 No0314(T05) C
MUNSELL
1.3 Y 7.0/ 1.9
P05 No0314(T05) C
L* a* b*
71.24 0.88 13.39
P05 No0315(T05) C
MUNSELL
0.5 Y 4.9/ 1.0
P05 No0315(T05) C
L* a* b*
50.47 1.23 6.82
P05 No0316(T05) C
MUNSELL
9.4 YR 6.4/ 3.2
P05 No0316(T05) C
L* a* b*
65.50 4.49 19.88
P05 No0317(T05) C
MUNSELL
4.1 YR 6.0/ 3.0
P05 No0317(T05) C
L* a* b*
61.23 8.65 13.99

P05 No0318(T05) C MUNSELL 4.5 Y 5.1/ 1.2	P05 No0318(T05) C L* a* b* 52.24 -0.77 8.95	
P05 No0319(T05) C MUNSELL 4.3 YR 4.4/ 2.2	P05 No0319(T05) C L* a* b* 45.05 7.30 10.96	
P05 No0320(T05) C MUNSELL 2.6 Y 5.9/ 0.5	P05 No0320(T05) C L* a* b* 60.68 -0.03 3.33	
P05 No0321(T05) C MUNSELL 0.5 Y 5.5/ 4.0	P05 No0321(T05) C L* a* b* 56.90 4.68 25.56	
P05 No0322(T05) C MUNSELL 0.2 Y 5.2/ 1.0	P05 No0322(T05) C L* a* b* 53.64 1.24 6.44	
P05 No0323(T05) C MUNSELL 2.6 Y 7.9/ 1.0	P05 No0323(T05) C L* a* b* 79.90 -0.41 7.58	
P05 No0324(T05) C MUNSELL 3.0 Y 5.4/ 1.4	P05 No0324(T05) C L* a* b* 55.60 0.08 10.16	
P05 No0337(T05) C MUNSELL 6.6 YR 4.9/ 2.8	P05 No0337(T05) C L* a* b* 50.98 6.95 14.91	
P05 No0338(T05) C MUNSELL 5.0 YR 4.6/ 1.1	P05 No0338(T05) C L* a* b* 47.80 3.40 5.62	
P05 No0372(T05) C MUNSELL 9.0 YR 6.7/ 2.2	P05 No0372(T05) C L* a* b* 68.11 3.29 13.73	

Density	255-275 T/dm^2 face 160-170 T/dm^2 background
Mosaic Patterns and descriptions	Guilloche, wave, peltarion, crow step, stripe
Comment/Explanations	Tints and shades of the colors were neglected to measure because due to the fine workmanship of the mosaics each line was made of a different tint/shade of the same hue. Those ones were added in CorelDraw with Select Color Tool.
Bibliography	Ergeç , 1999; Ergeç, 2007

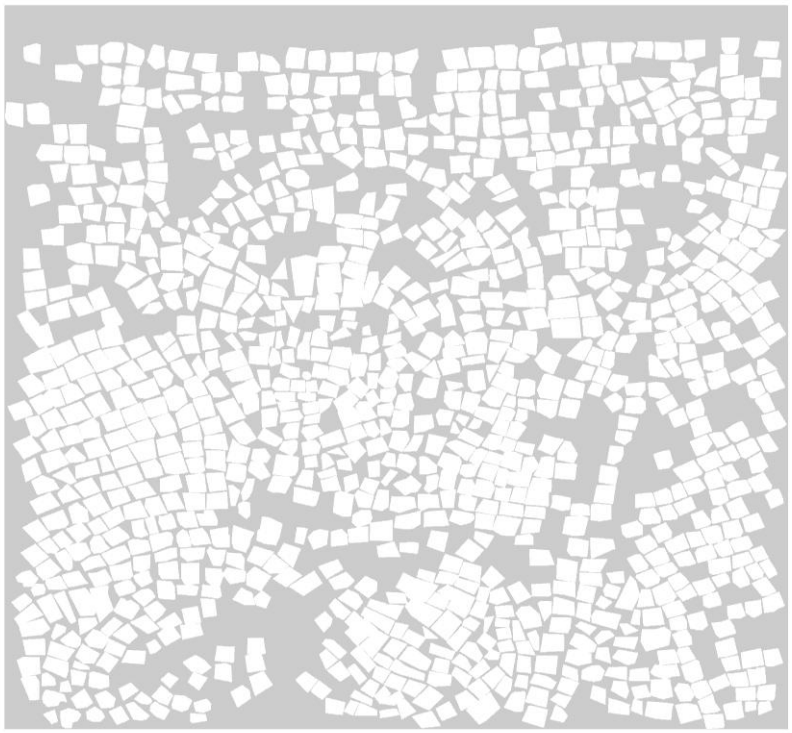
Drawings/ Photos



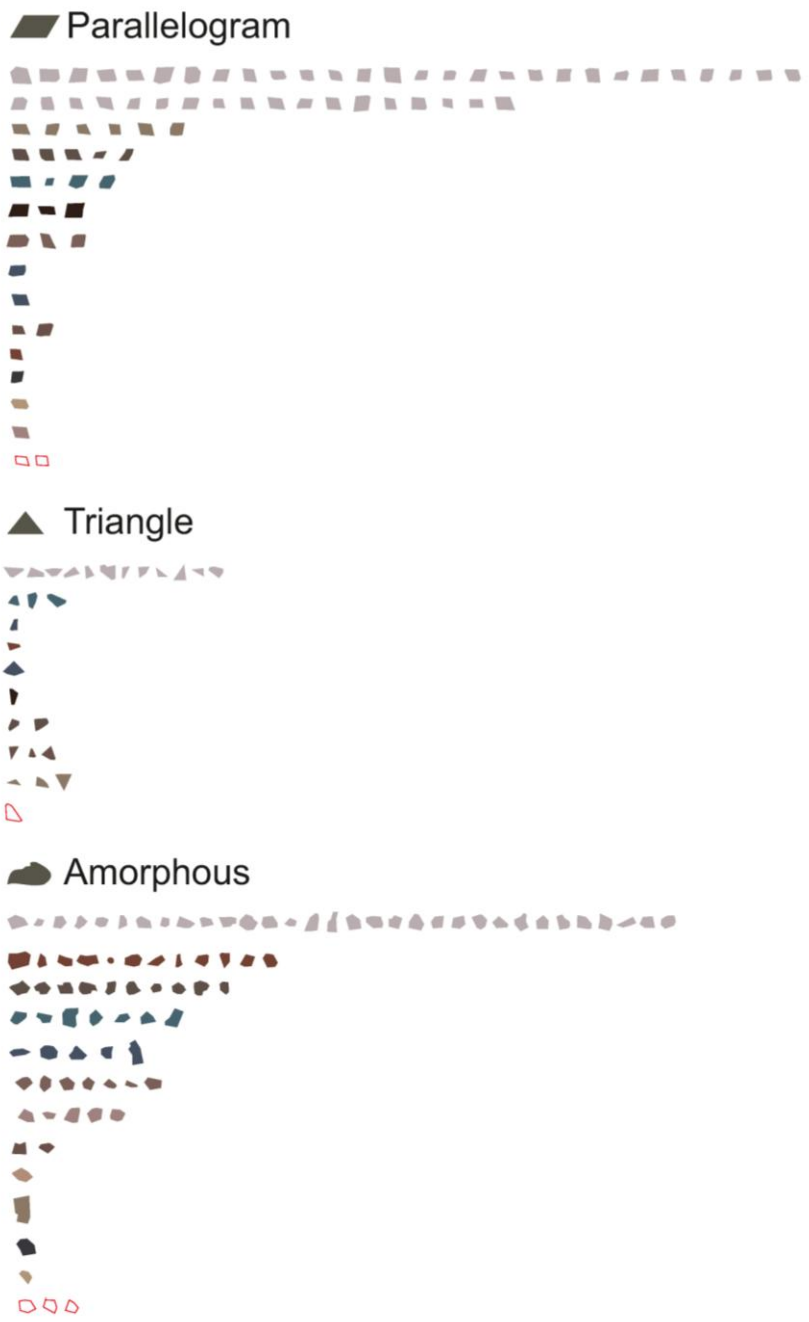


In “The Honeymoon of Dionysus and Ariadne” mosaic, location of the figurative panel differs from the general style of Roman Period. The deity and his wife were depicted on the left upper corner and Ariadne is invisible due to damage. Dionysus’ face is not detailed compared to other mosaics, but his thyrsos contains smalti in blue and turquoise colors; yellow, grey, red, black and beige are other distinguished colors of the mosaic. Tesserae size is between 0.5 and 1 cm.

Name of the Mosaic	**Honeymoon of Dionysus and Ariadne**
Corpus Number	15
Origin of the mosaic or the Archeological Settlement	Zeugma
Function of the Space	Euphrates villa, living room
Excavation Date	2000 (Salvage excavations by Gaziantep museum)
Period	Roman Period (2-3 Cent AD)
Current location and Protection Status of the Mosaic	Zeugma Mosaic Museum, Exhibition Hall
Size of the mosaic (in meters)	3.95 x 5.10 m in total 1.05 x 1.20 m panel
Technique of the Mosaic	Opus tessellatum
Tesserae Type	Cut Stone, Limestone, marble, smalti
Tesserae Size 1 cm in borders and background 0.5 cm – 1 cm in panel	
Tesserae Shape	



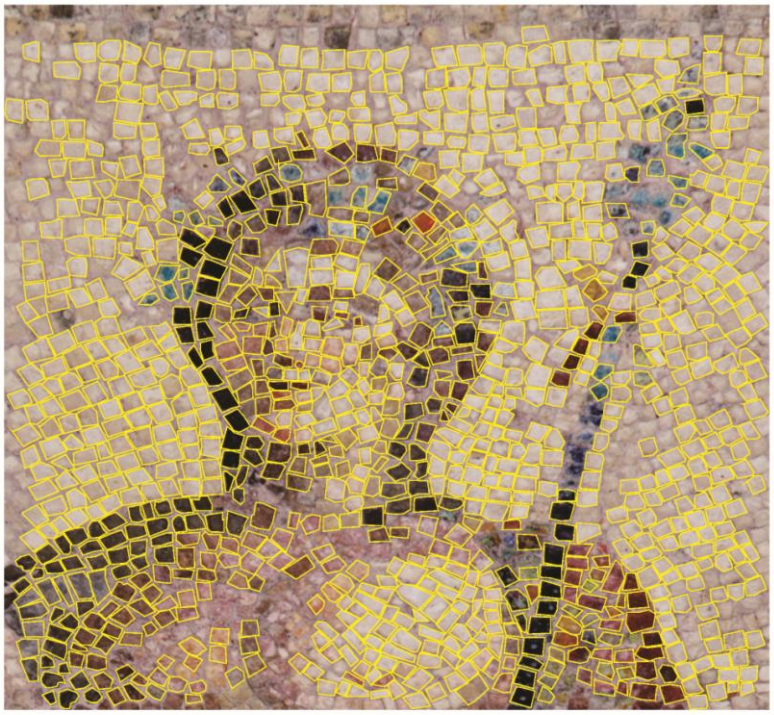

Square
Rectangle
Trapezoid



% of tesserae : Square 14% Rectangle 43% Trapezoid 23% Parallelogram 7%
Triangle 2% Amorphous 8%

Tesserae colors Beige, black, red in background and border; in panel yellow, grey, red, black, beige, blue and turquoise

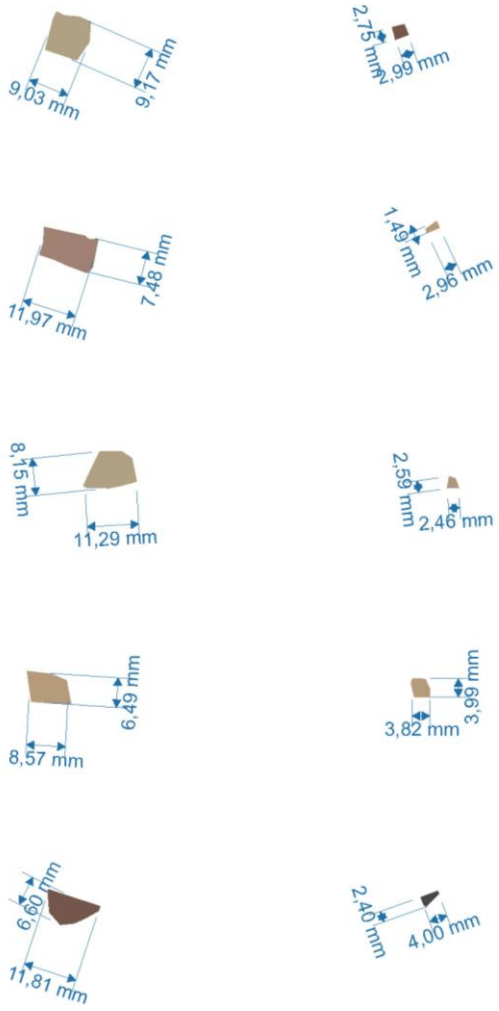
Density	
Mosaic Patterns and descriptions	Stripe, crow step , equilateral quadrangles (made of transverse parallel lines), three dimensional zigzagged band, stepped triangles
Comment/Explanations	This mosaic is being exhibited on floor; therefore it was not possible to investigate it from too close. However head of the Dionysus was captured successfully. In this mosaic on the contrary to other rooms panel is not in the center but on the left upper corner.
Bibliography	Ergeç, 2007
Drawings/ Photos	



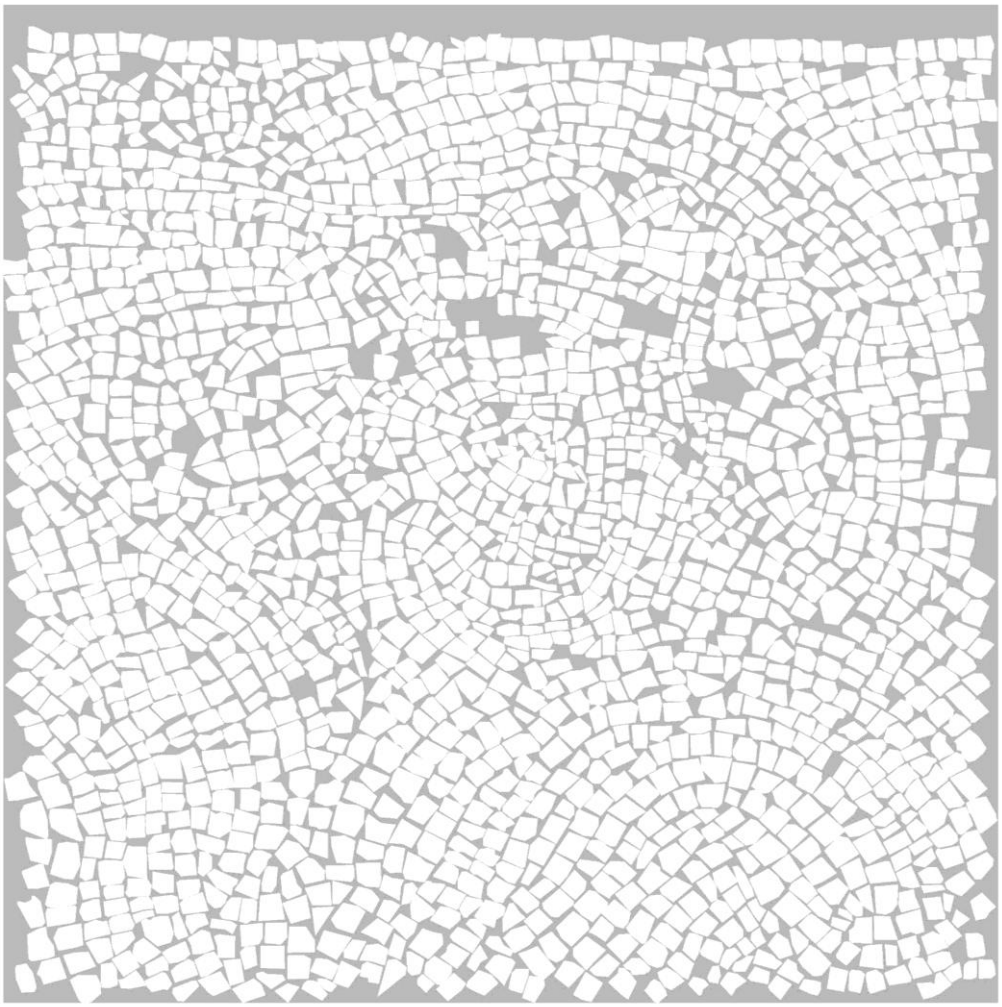
Name of the Mosaic	**Dionysus/ Telete/ Skyrtos**
Corpus Number	16
Origin of the mosaic or the Archeological Settlement	Zeugma
Function of the Space	Poseidon villa, resting room
Excavation Date	2000 (Salvage excavations by Gaziantep museum)
Period	Roman Period (3 Cent AD)
Current location and Protection Status of the Mosaic	Zeugma Mosaic Museum, Exhibition Hall
Size of the mosaic (in meters)	6.10 x 3.60 m in total 1.25 x 1.25 m panel
Technique of the Mosaic	Opus tessellatum, opus vermiculatum
Tesserae Type	Cut Stone, Limestone, marble

Tesserae Size (Biggest and smallest tesserae from each group)

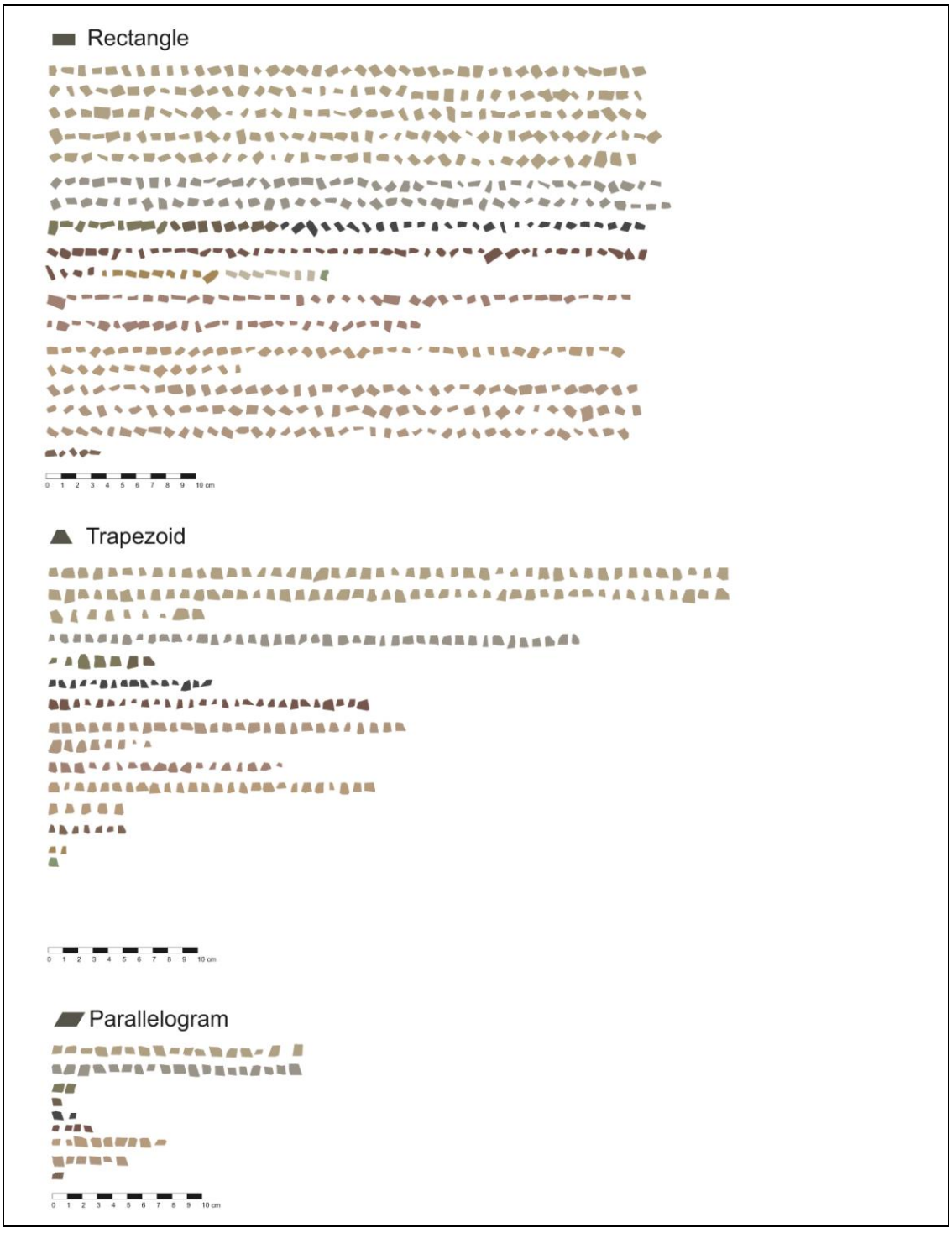
1- 1.2 cm in borders , background around 0.8 cm



Tesserae Shape

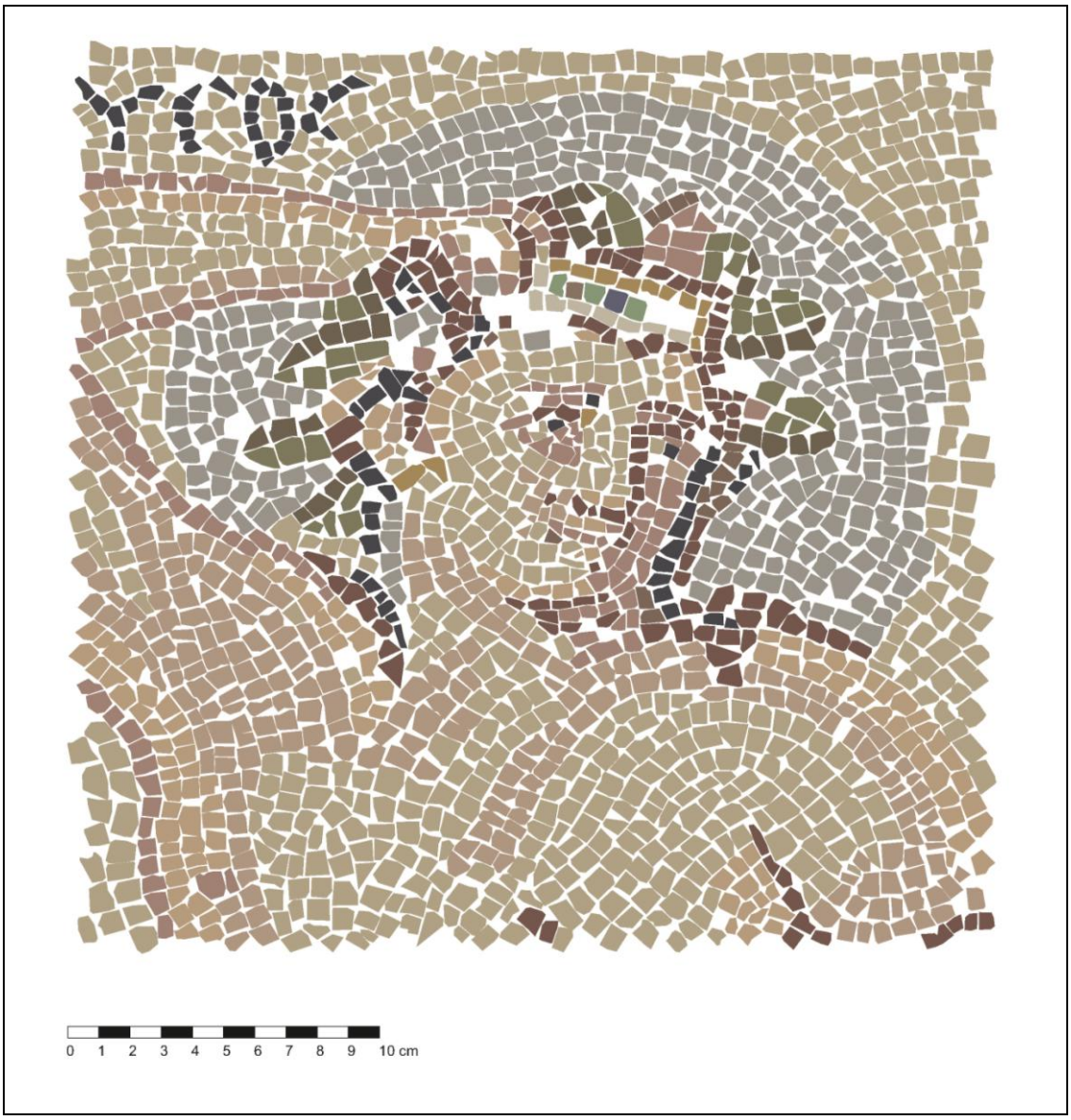


Square


Rectangle
0 1 2 3 4 5 6 7 8 9 10 cm
Trapezoid
0 1 2 3 4 5 6 7 8 9 10 cm
Parallelogram
0 1 2 3 4 5 6 7 8 9 10 cm

% of tesserae : Square 26% Rectangle 34% Trapezoid 15% Parallelogram 3%
Triangle 4% Amorphous 15%

Tesserae colors Yellow, beige, red, grey, blue, in figures pink, light pink, burgundy, white, grey, dark green, light green, red, blue

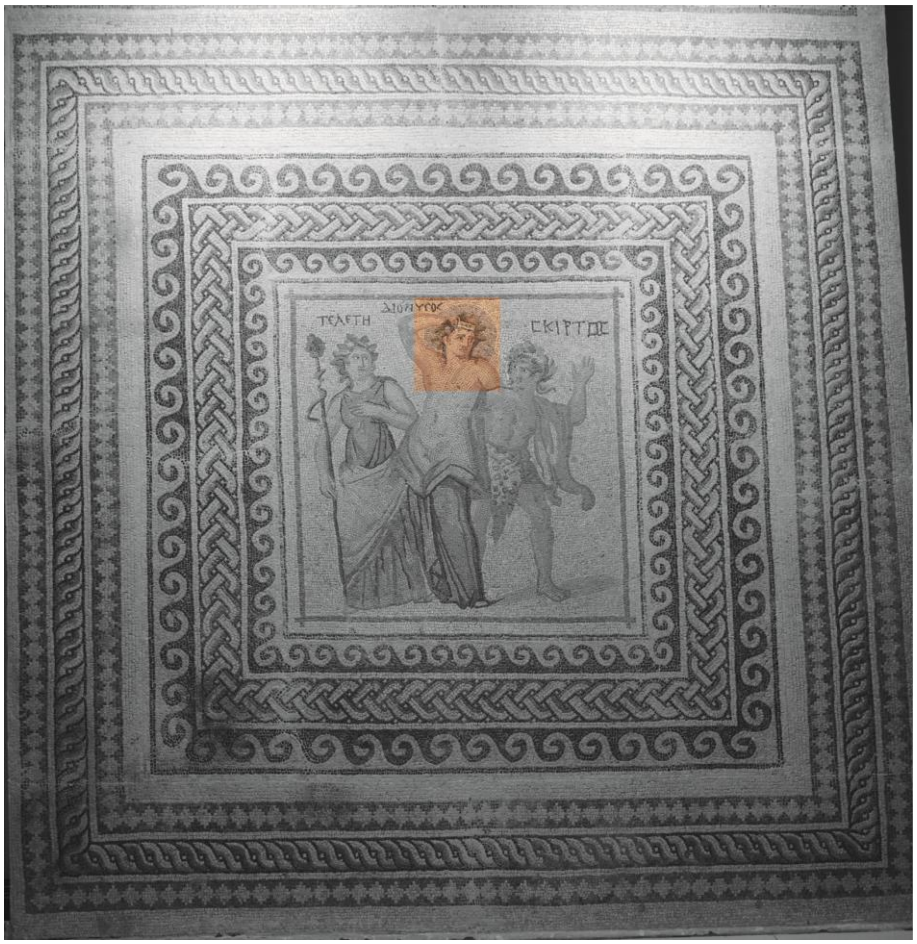

0 1 2 3 4 5 6 7 8 9 10 cm

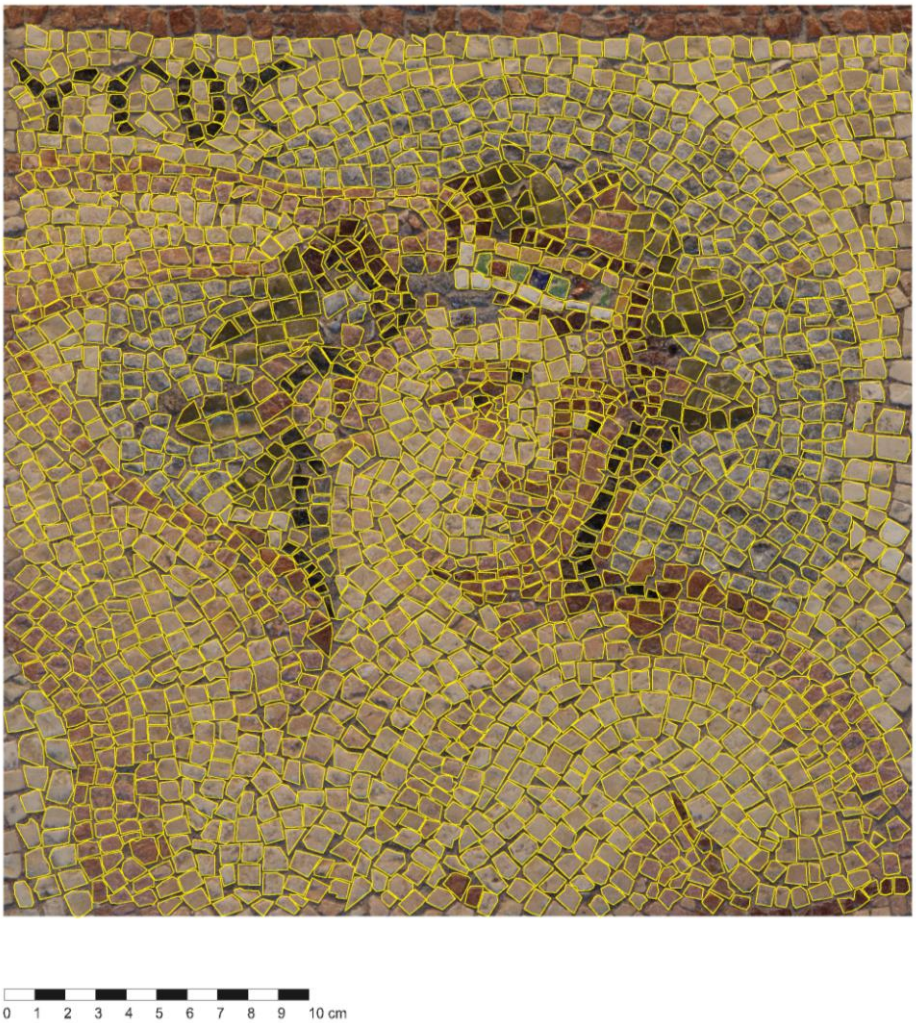

P05 No0319(T05) C
MUNSELL
4.3 YR 4.4/ 2.2
P05 No0319(T05) C
L* a* b*
45.05 7.30 10.96
P05 No0332(T05) C
MUNSELL
1.0 PB 3.0/ 0.1
P05 No0332(T05) C
L* a* b*
30.35 -0.14 -0.54
P05 No0344(T05) C
MUNSELL
1.4 YR 5.6/ 2.8
P05 No0344(T05) C
L* a* b*
57.13 9.77 10.82
P05 No0345(T05) C
MUNSELL
8.1 YR 6.4/ 3.2
P05 No0345(T05) C
L* a* b*
66.10 5.94 18.80
R:175 G:150 B:128
P05 No0346(T05) C
MUNSELL
6.3 YR 5.0/ 2.8
P05 No0346(T05) C
L* a* b*
51.76 7.07 14.61
R:116 G:86 B:76
P05 No0347(T05) C
MUNSELL
1.6 Y 6.6/ 2.3
P05 No0347(T05) C
L* a* b*
67.38 1.11 16.29

Density	280-290 T/dm^2 on the face 190-200 T/dm^2 on the body 200-220 T/dm^2 mean of the selected part
Mosaic Patterns and descriptions	Double strand guilloche, waves, stepped crow step, stripes
Comment/Explanations	Telete means festival, ritual and an understanding of the mysteries attains a special meaning when mentioned with the name of a deity, indicates all

	arrangements for that deity and having an understanding of his mysteries.
Bibliography	Ergeç, 2007

Drawings/ Photos



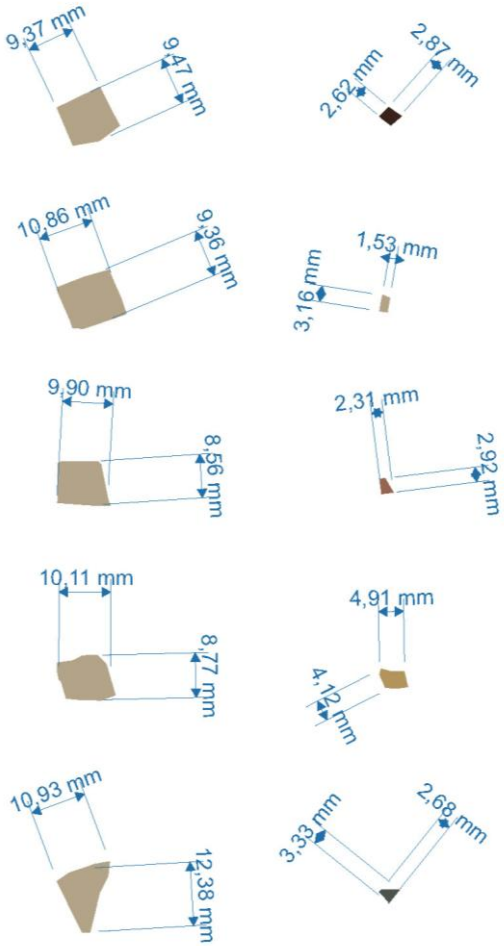


Dionysus, Telete, Skyrtos Mosaic was unearthed in 2000 from Poseidon Villa (Corpus No 16). Mosaic is 6.10 x 3.60 m in total though central panel is 1.25 x 1.25 m. Borders occupies large portion of this mosaic which are double-strand guilloche, waves, stepped crow step and stripes. Mosaic has second highest density in Zeugma Mosaics investigated and depicted with 16 color chips in the catalog. Those color chips include ones with RGB values as well which are used when a specific hue went unmeasured or detection was substantially different than tesserae color. Measurement with Konika Minolta Chroma meter occurs by replacing the device on the surface to be detected, which hardens to see where the device is targeting. This may lead to measure wrong area such as another tesserae or mortar. In such occasions chips with RGB values prepared in CorelDraw by measuring tesserae from photograph was added.

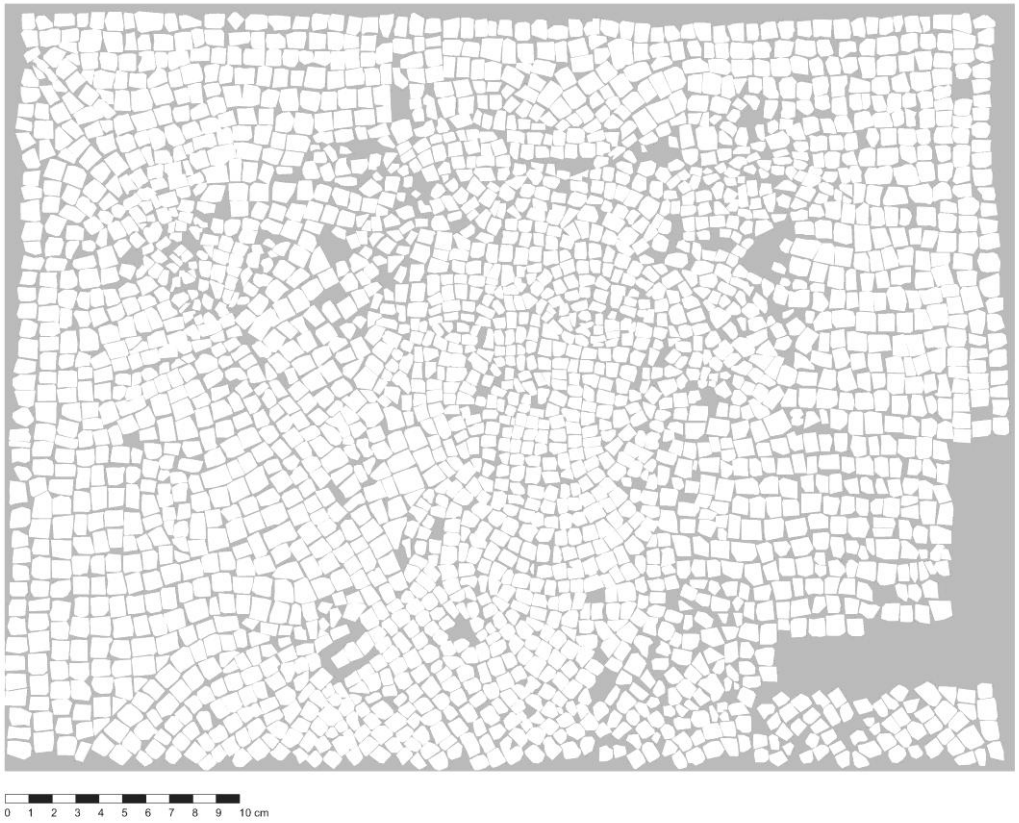
Name of the Mosaic	**Dionysus Bust**
Corpus Number	17
Origin of the mosaic or the Archeological Settlement	Zeugma
Function of the Space	Shallow pool of an unknown building
Excavation Date	2003 (Salvage excavations by Gaziantep museum)
Period	Roman Period (2- 3 Cent AD)
Current location and Protection Status of the Mosaic	Zeugma Mosaic Museum, Exhibition Hall
Size of the mosaic (in meters)	1.51 x 1.51 m.
Technique of the Mosaic	Opus tessellatum, opus vermiculatum
Tesserae Type	Cut Stone, Limestone, smalti

Tesserae Size (Biggest and smallest tesserae from each group)

1cm in borders and background

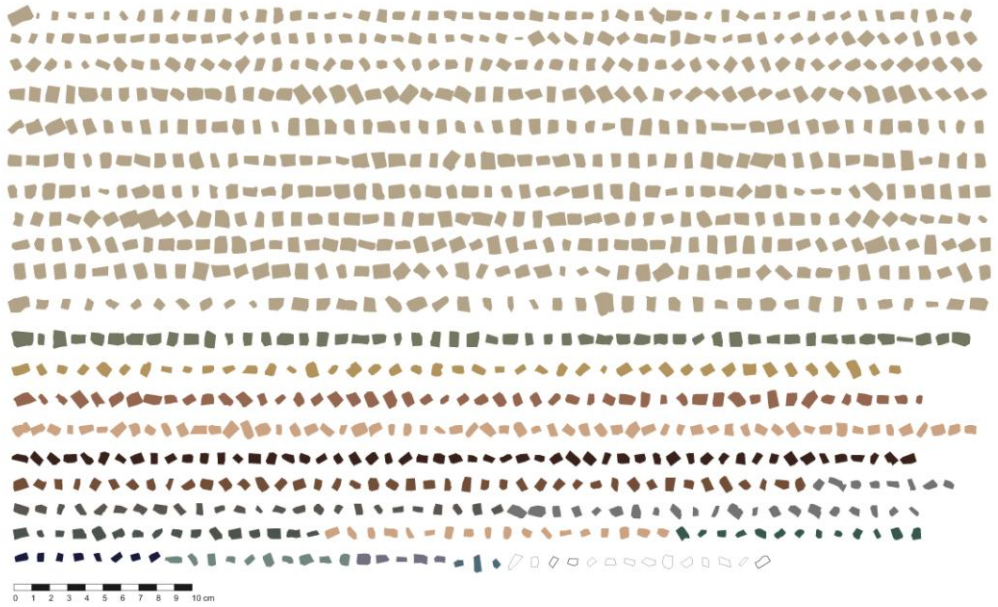


Tesserae Shape



Square

Rectangle



Trapezoid

Parallelogram

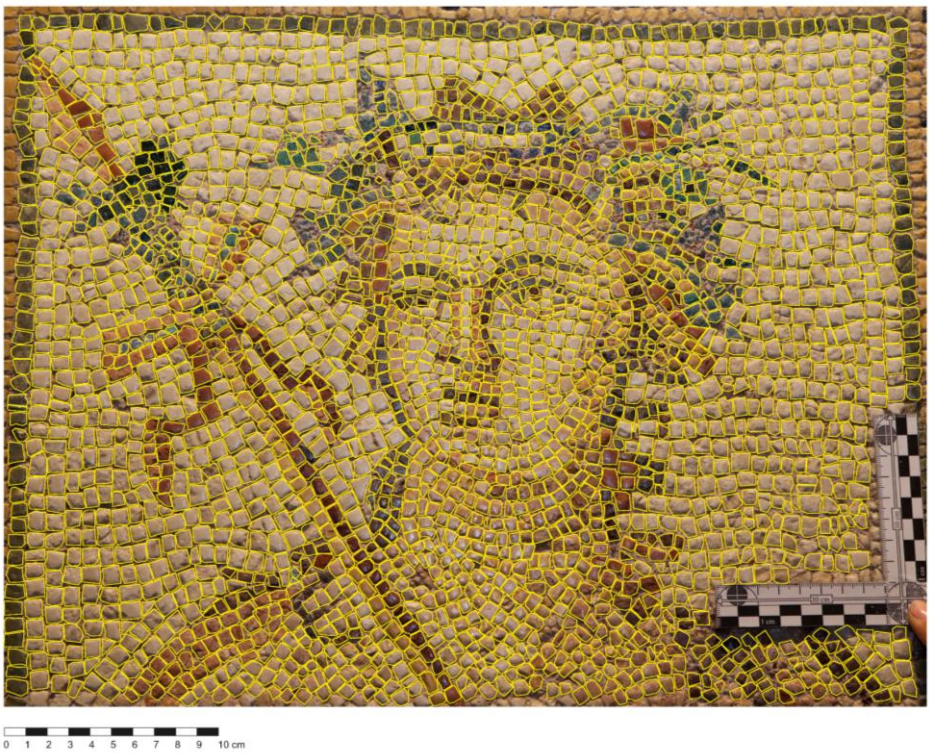
% of tesserae : Square 27% Rectangle 40% Trapezoid 15% Parallelogram 3%
Triangle 3% Amorphous 9%

Tesserae colors Yellow, beige, black, red, blue, grey, green, in diadem different blues and greens made of smalti


0 1 2 3 4 5 6 7 8 9 10 cm
P05 No0358(T05) C
MUNSELL
10. 0 YR 6. 1/ 5. 0
P05 No0358(T05) C
L* a* b*
63. 09 6. 28 32. 03
P05 No0359(T05) C
MUNSELL
1. 0 GY 4. 7/ 1. 7
P05 No0359(T05) C
L* a* b*
48. 70 -4. 17 11. 21
P05 No0360(T05) C
MUNSELL
4. 8 YR 6. 8/ 4. 4
P05 No0360(T05) C
L* a* b*
69. 62 11. 42 21. 79
P05 No0361(T05) C
MUNSELL
1. 6 YR 4. 7/ 4. 7
P05 No0361(T05) C
L* a* b*
48. 47 16. 98 19. 04


P05 No0356(T05) C
MUNSELL
0.3 Y 6.6/ 2.2
P05 No0356(T05) C
L* a* b*
67.78 2.26 14.78
P05 No0357(T05) C
MUNSELL
0.4 Y 3.6/ 0.5
P05 No0357(T05) C
L* a* b*
36.59 0.74 3.35
P05 No0362(T05) C
MUNSELL
1.9 G 3.4/ 0.9
P05 No0362(T05) C
L* a* b*
34.57 -3.77 2.12
P05 No0363(T05) C
MUNSELL
4.9 G 4.8/ 0.3
P05 No0363(T05) C
L* a* b*
49.18 -1.74 0.65
P05 No0364(T05) C
MUNSELL
9.5 G 5.3/ 1.8
P05 No0364(T05) C
L* a* b*
54.91 -9.80 1.53
R:24 G:27 B:60
R:115 G:79 B:57
R:77 G:107 B:118

R:57 G:34 B:28  R:56 G:88 B:77  R:115 G:112 B:129 	
Density	280-300 T/dm^2 face 160-180 T/dm^2 background
Mosaic Patterns and descriptions	Stripes, Three-strand guilloche, waves, stepped crow step
Comment/Explanations	In this mosaic, morphologically a difference was noticed. In general tesserae used in Zeugma Mosaics are stones with flat surface. However in this mosaic all tesserae were domed. Along this, use of smalti is seen in the Dionysus Diadem which gives a different impression to the mosaic.
Bibliography	Ergeç, 2007
Drawings/ Photos	


0 1 2 3 4 5 6 7 8 9 10 cm

Dionysus Bust (Corpus No 17) belongs to a shallow pool of an unknown building unearthed in 2003. Central figure contains highest number of tesserae per dm^2 and size goes down to 1.5 mm. Tesserae of this mosaic morphologically differ from other investigated in Zeugma Museum. Instead of flat surface those tesserae were domed along green, blue, turquoise smalti. This difference is due to where mosaic was used. This mosaic was from a shallow pool and differed from other investigated mosaics which used in rooms of the houses. Color for smalti could not be detected with chroma meter due to the gleaming while capturing it; therefore those colors were detected in the computer. Mosaic is surrounded by stripes, three-strand guilloche, waves and stepped crow step. Use of smalti is also seen in Byzantium mosaic from Samosata (Corpus No 6) from Late Roman Period. Distinguished smalti color is green but also green tesserae from cut stone was used in the mosaic (Figure 4.7). This might indicate that there were some local sources to obtain blue and green cut-stone tesserae but those were not sufficient enough to express the image artists wanted to create. Therefore use of smalti mostly in colors of blue, green, turquoise and blue-green is seen in Commagene Region mosaics.

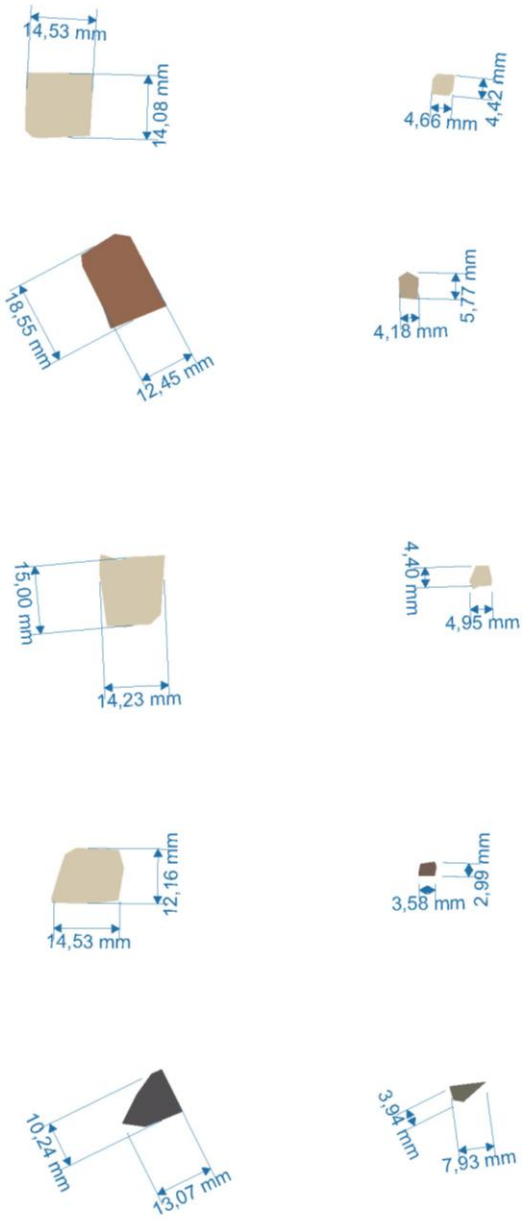
Figure 4.7 Green cut-stone tesserae from Byzantium Mosaic (Y. Tanrıverdi, 2015)

Figure 4.8 Detail of Dionysus Medallion (from O. Dolaş's archive)

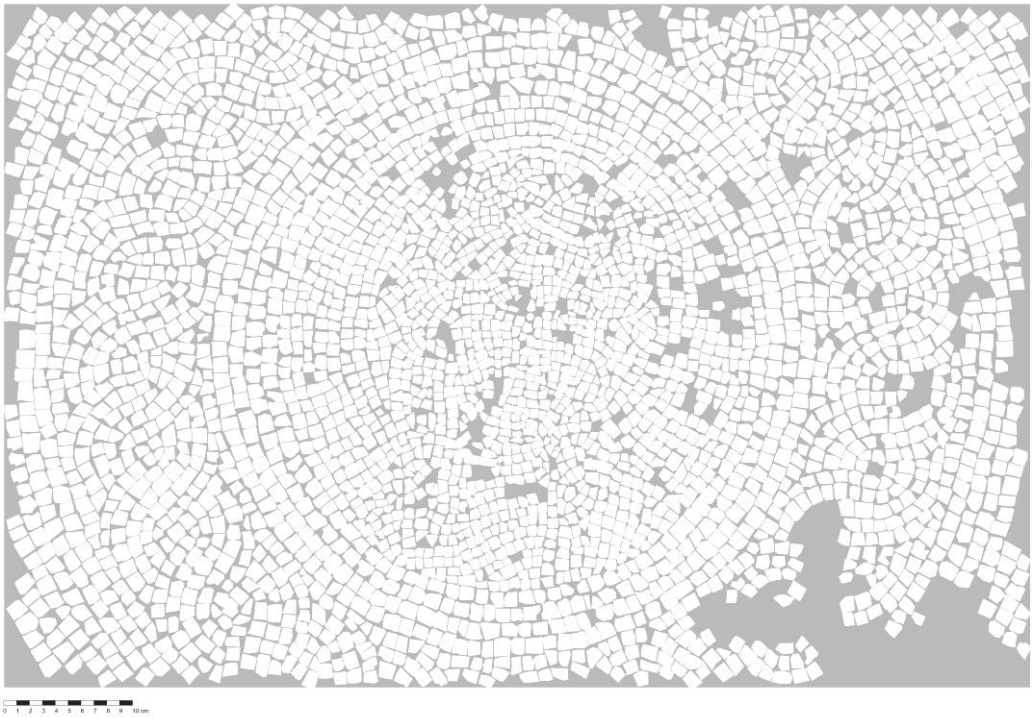
Another mosaic from Zeugma museum was Dionysus Medallion (Corpus No 18) excavated in 1999 from Oceanus Villa. Smallest tesserae size is bigger compared to other Zeugma mosaics and Samosata Mosaic with Fishes (Figure 4.5). Biggest tesserae size significantly differs from rest Zeugma mosaics, because this mosaic is drawn with its surrounding including motifs. Density of tesserae is also lower than Zeugma collection but others. Mosaic contains moderate size of tesserae compared to others but the mortar between tesserae is slightly discernible which may be taken as depiction of artist's fine work (Figure 4.8).

Name of the Mosaic	**Dionysus Medallion**
Corpus Number	18
Origin of the mosaic or the Archeological Settlement	Zeugma
Function of the Space	Oceanus Villa, west portico of the peristyle
Excavation Date	1999 (Salvage excavations by Gaziantep museum)
Period	Roman Period (2- 3 Cent AD)
Current location and Protection Status of the Mosaic	Zeugma Mosaic Museum, Exhibition Hall
Size of the mosaic (in meters)	
Technique of the Mosaic	Opus regulatum, Opus vermiculatum
Tesserae Type	Cut Stone, Limestone

Tesserae Size (Biggest and smallest tesserae from each group)



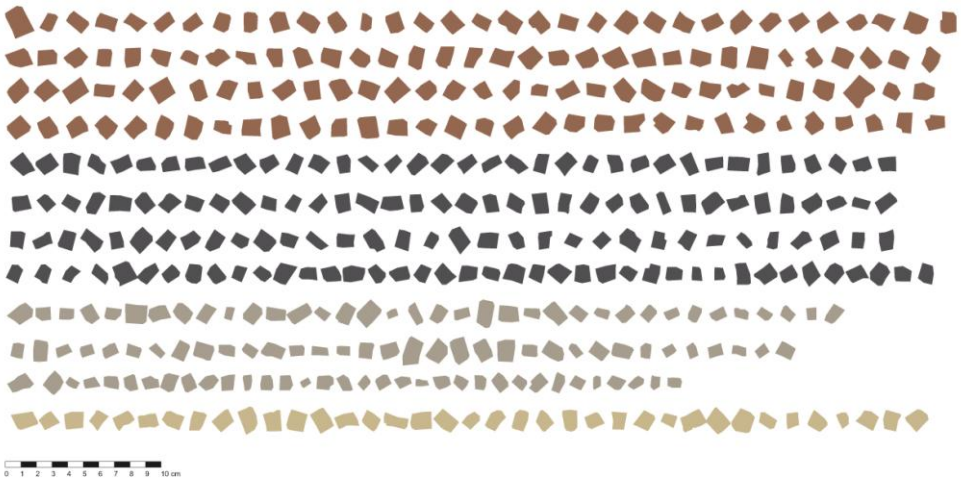
Tesserae Shape



Square

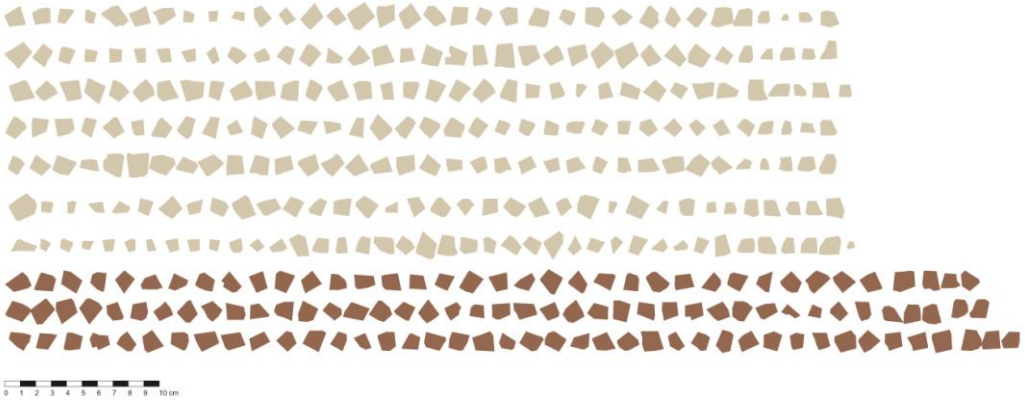

Square
0 1 2 3 4 5 6 7 8 9 10 cm
Rectangle
0 1 2 3 4 5 6 7 8 9 10 cm

Rectangle



Rectangle

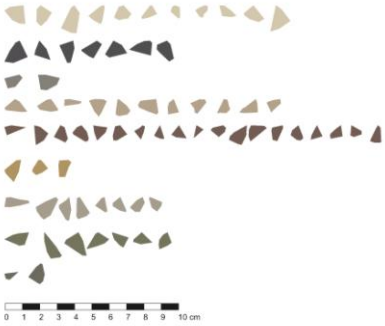
Trapezoid



Trapezoid

Parallelogram

Triangle



% of tesserae : Square 28% Rectangle 32% Trapezoid 22% Parallelogram 3%
Triangle 2% Amorphous 12%

Tesserae colors Grey, Beige, Black, Yellow, brick color, orange, pink, their tints and shades


P05 No0373(T05) C
MUNSELL
0.1 Y 5.2/ 3.7
P05 No0373(T05) C
L* a* b*
53.54 5.13 23.62
P05 No0374(T05) C
MUNSELL
0.5 Y 6.1/ 4.7
P05 No0374(T05) C
L* a* b*
62.80 5.18 30.44
P05 No0375(T05) C
MUNSELL
1.4 Y 6.5/ 3.7
P05 No0375(T05) C
L* a* b*
66.70 2.58 25.18
P05 No0376(T05) C
MUNSELL
9.3 Y 4.8/ 1.6
P05 No0376(T05) C
L* a* b*
49.34 -3.24 11.58
P05 No0377(T05) C
MUNSELL
7.7 Y 4.4/ 0.7
P05 No0377(T05) C
L* a* b*
45.12 -1.02 4.74
P05 No0378(T05) C
MUNSELL
6.0 YR 4.5/ 3.4
P05 No0378(T05) C
L* a* b*
46.30 9.40 18.17
P05 No0379(T05) C
MUNSELL
2.7 YR 4.0/ 1.7
P05 No0379(T05) C
L* a* b*
41.15 6.68 7.73
P05 No0380(T05) C
MUNSELL
8.3 YR 4.8/ 1.5
P05 No0380(T05) C
L* a* b*
49.49 3.19 9.09

Density	165-185 T/dm^2 face 75-95 T/dm^2 background 105 T circumference of medallion (Diameter : 40 cm)
Mosaic Patterns and descriptions	Stripes, stepped crow step, equilateral quadrangles, rectangles, double-strand guilloche, square inscribed in lozenge along the short axis
Comment/Explanations	This mosaic is similar to the one in Adıyaman Museum as the way deity was illustrated.
Bibliography	Balmelle, et al., 1985; Ergeç, 2007
Drawings/ Photos	

105 Tesserae in circumference of medallion (Diameter : 40 cm)
Medallion contains 1547 tesserae

Name of the Mosaic	**Return of Dionysus from India**
Corpus Number	19
Origin of the mosaic or the Archeological Settlement	Zeugma
Function of the Space	Poseidon villa, triclinium
Excavation Date	1999 (Salvage excavations by Gaziantep museum)
Period	Roman Period (2 Cent AD)
Current location and Protection Status of the Mosaic	Zeugma Mosaic Museum, Exhibition Hall
Size of the mosaic (in meters)	
Technique of the Mosaic	Opus tessellatum, Opus vermiculatum
Tesserae Type	Cut Stone, Limestone, marble
Tesserae Size This mosaic was located on the floor of the Gaziantep Mosaic museum. The permission to walk or touch the mosaic was not granted therefore mosaic was photographed from the mezzanine floor. Resolution was not good enough to analyze the tesserae sizes. Additional photographs were obtained from Mehmet Önal however resolution was not appropriate to analyze again. Size and Shapes of this mosaic could not be provided in this study.	
Tesserae Shape	
Tesserae colors Beige, black, red in background and border; in panel yellow, grey, red, black, beige, blue and turquoise (Ergeç, 2007).	
Density	
Mosaic Patterns and descriptions	
Comment/Explanations	This mosaic was only listed since it illustrated Dionysus. Museum authorities only grant permission to investigate the mosaic by constructing a bridge over and take the photos afterwards. Therefore related information was taken from the literature.
Bibliography	Ergeç, 2007
Drawings/ Photos 	

“The Return of Dionysus from India” mosaic is second central panel of a T shaped triclinium (dining room) mosaic (Figure 4.9). The other panel portrays Pasiphae-Daidalos. Panels framed with different geometrical motifs including three dimensional swastikas, Solomon knots, discs, bird figures, waves and square and rectangular geometrical motifs. The deity was portrayed with his halo behind his head. He is holding his thyrsos with green ribbons around it. His diadem is yellow looks like gold. His face is delineated in detail. Seven tesserae were used to depict his eyeball, however it is not close enough to decide whether they are roundel or not. Besides, eyeball of Nike figure standing next to deity was made with roundel tessera as a definitive piece in the mosaic. Tesserae shapes of the mosaic and color measurements could not be done due to the location of the mosaic.

Lastly overall motif information collected from catalog states (Table 4.1) Arsameia mosaics include waves, turreted wall, meander and pyramidal crow step. Samosata examples had waves, meander and pyramidal crow step commonly used. According to new findings, Perrhe mosaics are made of geometric compositions mostly and further studies may reveal most common motifs but according to results of this study meander, guilloches and zigzag patterns preferred. Zeugma mosaics contain guilloches, waves and crow steps at most. Meander was common among all settlements.

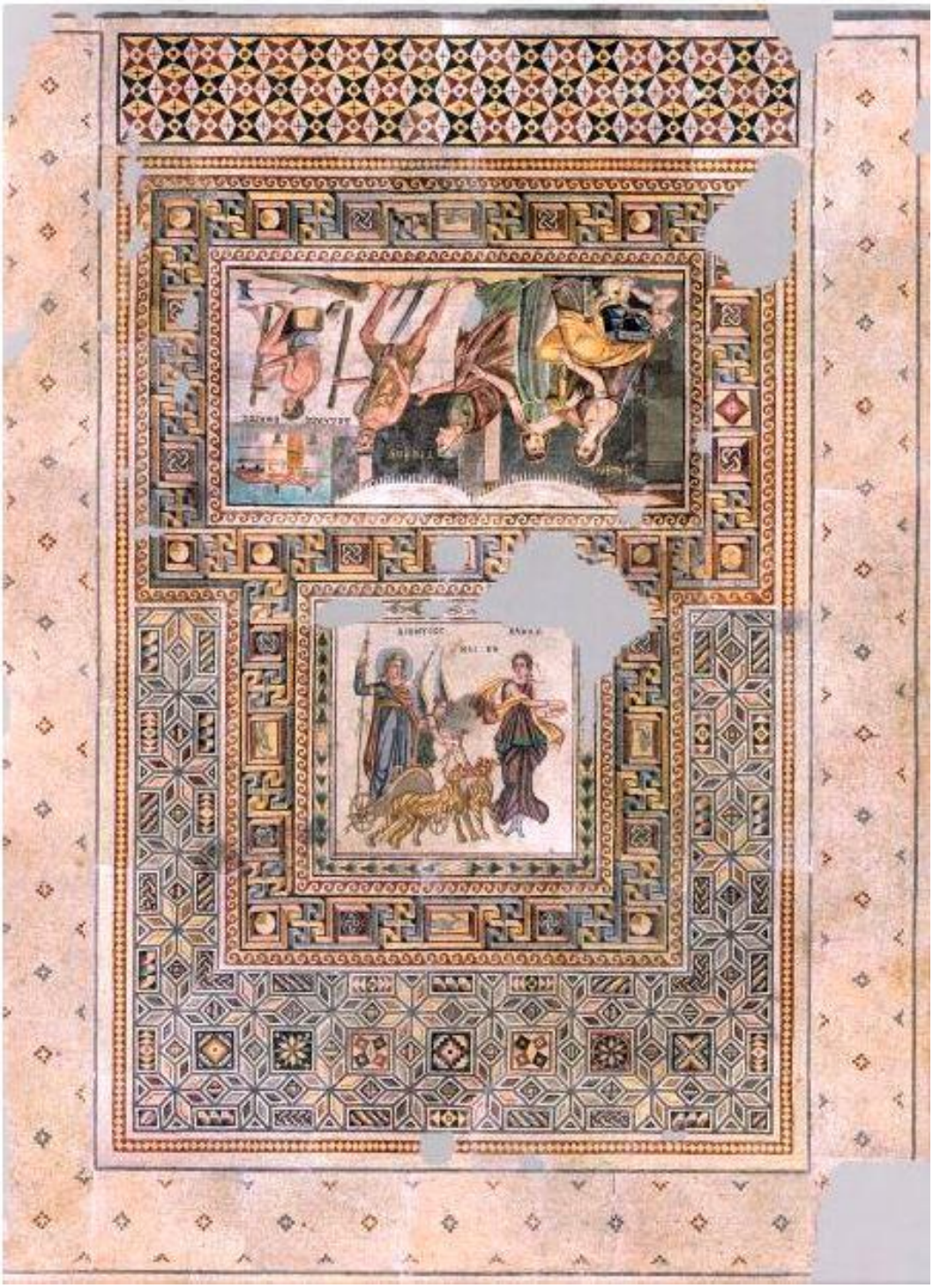


Figure 4.9 Pasiphae-Daidalos and Return of Dionysus from India mosaic (Şahin, 2013)

Table 4.2 Overall information of Commagene Region Mosaics

	Figurative/Texture	Monochrome/Coloured	Whole Size	Sample Size	Location	Building	Place	Time Period
Arsameia Mosaic I	Both	Coloured	10.60 x 8.30 m	No Sample	Arsameia	Ceremonial Space		Late Hellenistic
Arsameia Mosaic II	Both	Coloured	13.85 x 14.62 m	No Sample	Arsameia	Ceremonial Space II		Late Hellenistic
Mosaic with Fishes	Figurative	Coloured	4.60 x 3.65 m	0.24 x 0.22 m	Samosata	Samosata Palace	Room II	Late Hellenistic
Mosaic with Fishes (3a)	Figurative	Coloured	4.60 x 3.65 m	0.26 x 0.17m	Samosata	Samosata Palace	Room II	Late Hellenistic
Mosaic with Fishes (3b)	Texture (Border)	Monochrome	4.60 x 3.65 m	0.26 x 0.17m	Samosata	Samosata Palace	Room II	Late Hellenistic
Mosaic with Fishes (3c)	Texture (Border)	Monochrome	4.60 x 3.65 m	0.27 x 0.18 m	Samosata	Samosata Palace	Room II	Late Hellenistic
Mosaic with Fishes (3d)	Texture (Border)	Coloured	4.60 x 3.65 m	0.25 x 0.17 m	Samosata	Samosata Palace	Room II	Late Hellenistic
Chequerboard Mosaic	Texture	Monochrome	4.65 x 1.65 m	0.11 x 0.15 m	Samosata	Samosata Palace	Corridor	Late Hellenistic
Big Hall Mosaic	Texture	Monochrome	13m in total	No Sample	Samosata	Samosata Palace	Room B2	Late Hellenistic
Byzantium Mosaic	Figurative	Coloured	1.70 x 1.20 m	0.20 x 0.12 m	Samosata	Unknown	Unknown	Byzantium
Perrhe Mosaic 1	Texture	Coloured	Not attainable	0.22 x 0.15 m	Perrhe	Unknown	Unknown	3-6th Cent.
Perrhe Mosaics in Situ	Both	Coloured	4.80 x 5.15 m	No Sample	Perrhe	Villa with Mosaics	Room A	2nd Cent
Perrhe Mosaics in Situ	Both	Coloured	4.27 x 4.00 m	No Sample	Perrhe	Villa with Mosaics	Room B	2nd Cent
Ellipse Mosaic	Texture (Background)	Coloured	3.15 x 1.60 m	0.27 x 0.18 m	Perrhe	Building with Apse	Unknown	3-6th Cent.
Ellipse Mosaic (10a)	Figurative	Coloured	3.15 x 1.60 m	No scale	Perrhe	Building with Apse	Unknown	3-6th Cent.
Perrhe Mosaic 2	Texture	Coloured	Not attainable	0.40 x 0.28 m	Perrhe	Unknown	Unknown	3-6th Cent.
Bahasna Mosaic 1	Texture	Coloured	Not attainable	No Sample	Bahasna	Church	Unknown	6-7th Cent
Bahasna Mosaic 2	Texture	Coloured	Not attainable	No Sample	Bahasna	Unknown	Unknown	6-7th Cent
Dionysus Mosaic	Figurative	Coloured	0.35 x 0.70 m	0.41 x 0.25 m	Zeugma	Oceanus Villa	Room	2-3th Cent
Honeymoon of Dionysus	Figurative	Coloured	3.95 x 5.10 m	No scale	Zeugma	Euphrates Villa	Living Room	2-3th Cent
Dionysus/Telete/Skyrto	Figurative	Coloured	6.10 x 3.60 m	0.30 x 0.29 m	Zeugma	Poseidon Villa	Rest. Room	3th Cent
Dionysus Bust	Figurative	Coloured	1.51 x 1.51 m	0.43 x 0.32 m	Zeugma	Unknown	Pool	2-3th Cent
Dionysus Medallion	Figurative	Coloured	3.05 x 1.10 m	0.79 x 0.53 m	Zeugma	Oceanus Villa	Peristyle	2-3th Cent
Return of Dionysus Indi	Figurative	Coloured	Not attainable	No Sample	Zeugma	Poseidon Villa	Triclinium	2nd Cent

Commagene Region contains a great variety of mosaics from different settlements and different periods. There are Hellenistic Period mosaics from settlements like Arsameia and Samosata; Roman period mosaics from Perrhe, Bahasna and Zeugma and also few examples from Byzantium Period such as Byzantium Mosaic of Samosata. In literature generally period is a substantial parameter to compare and discuss mosaics. Period may also affect the appearance of mosaics where earlier examples were made of monochrome tesserae and latter contained colored ones. Monochrome and colored mosaics may differ according to themes, style and mastery which can be taken as an important factor in comparing mosaics. However in this study geography was taken as primary parameter. Commagene Region was used as a start point of the study. Therefore examples included mosaics from different periods. Since the study did not make any attempt to cover style and theme in mosaics it was possible to compare mosaics from different periods within each other. However figures or textures such as borders/background were taken in count while discussing. Because there were significant differences in tesserae sizes and densities of mosaics at the central panels and borders/ background.

There was only one example of monochrome mosaic (Chequerboard Mosaic) from Samosata which was excavated from Samosata Palace. This mosaic was not an exquisite one and made for functional use to use it in a corridor. Only monochrome samples from Samosata were from borders of Mosaic with Fishes and Big Hall Mosaic which was not attainable for this study. Therefore it was not possible to compare monochrome/coloured mosaics within each other. The best solution was to compare Samosata mosaics with Arsameia mosaics though Arsameia mosaics did not last today. Samosata Fish Mosaic as a figurative mosaic and compared to other mosaics with figures from different settlements.

Perrhe examples were not quite enough to compare them with other settlements though the ones with textures was easier to compare. Perrhe and Zeugma mosaics were both from Roman Period and contained colorful mosaics with many color chips detected. A comparative table would give necessary information to understand and compare mosaics from different settlements and to understand most important parameters such as figure, texture, color, size, location and period (Table 4.2).

Color chips measured for the study contain Munsell Color and Lab Color values. Munsell values are represented with three different variables stands for Hue (H), Value (V) and Chroma (C). Hues detected are from red (R), yellow-red (YR), yellow (Y), yellow-green (GY), green (G), blue-green (BG), blue (B), purple-blue (PB) pages of Munsell Soil Color Chart. Color chips are measured from Samosata, Perrhe and Zeugma. Arsameia mosaics did not last today and Bahasna mosaics were not attainable for this study. According to results there is only one chip measured from red page obtained from Perrhe mosaics which may be the fact that artists borrowed it from one of the neighboring locations. None of the other Commagene locations has any tesserae from this page (Figure 4.10).

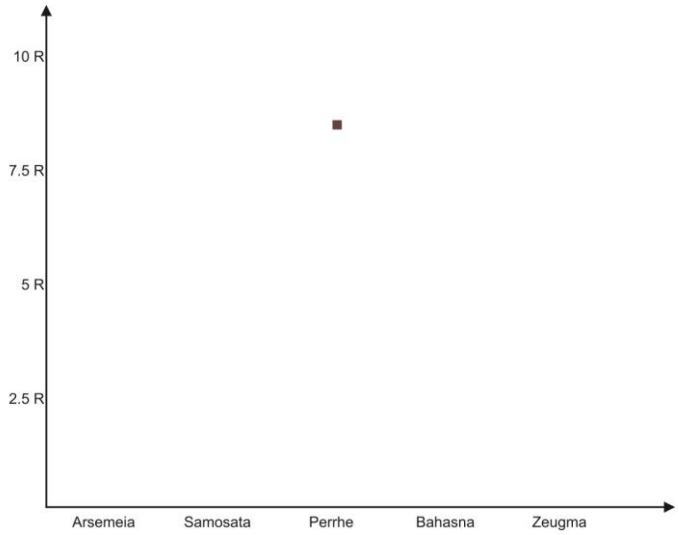


Figure 4.10 Distribution of color chips on red page

Yellow-red and yellow pages contain highest number of chips from all three locations. Samosata color chips are mainly from Y page around 2.5-5Y, Perrhe are from both from Y and YR pages and mostly contain 2.5-5Y values. Zeugma color chips are around 2.5Y and 10 YR.

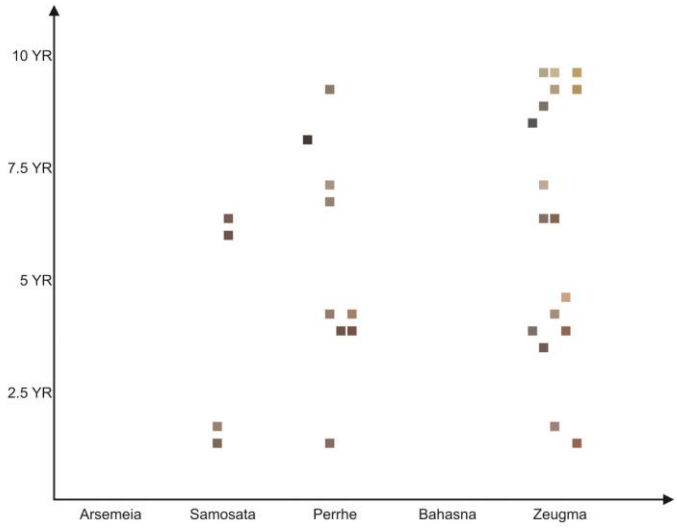


Figure 4.11 Distribution of color chips on yellow-red page

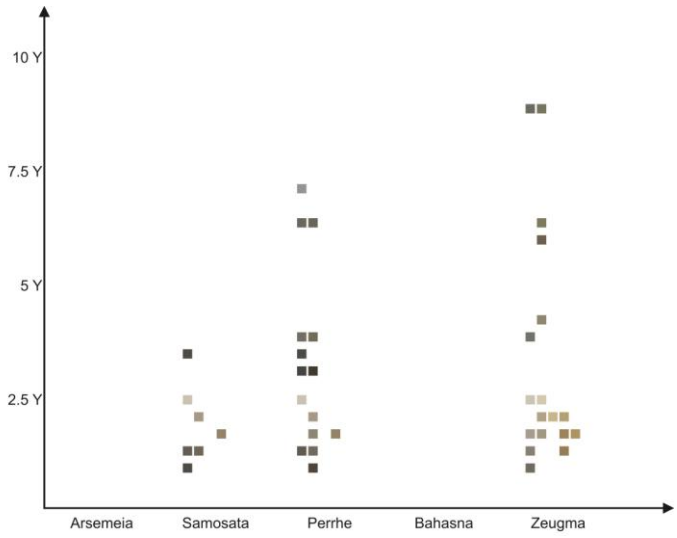


Figure 4.12 Distribution of color chips on yellow page

Green-yellow (GY) and green (G) pages contain fewer color chips compared to Y and YR pages. It should be noted; to obtain green and blue colors artists preferred smalti use. Chroma meter used in this study was not an appropriate tool to detect smalti's color values therefore those chips were presented with RGB values both in catalog and Appendix A. Distribution of color chips differ in both diagrams which hardens to claim those tesserae were obtained from same source. However all three

settlements contain tesserae from 2.5G. Perrhe samples include highest amount of chips in GY page. This is a promising result for unearthed mosaics of the settlement.

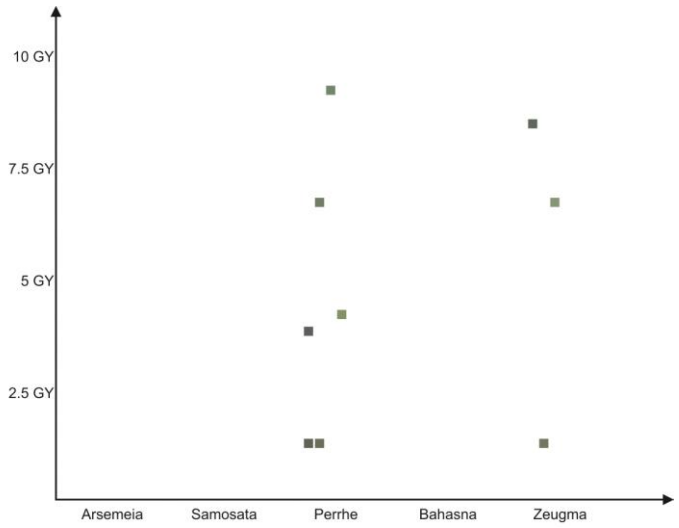


Figure 4.13 Distribution of color chips on green-yellow page

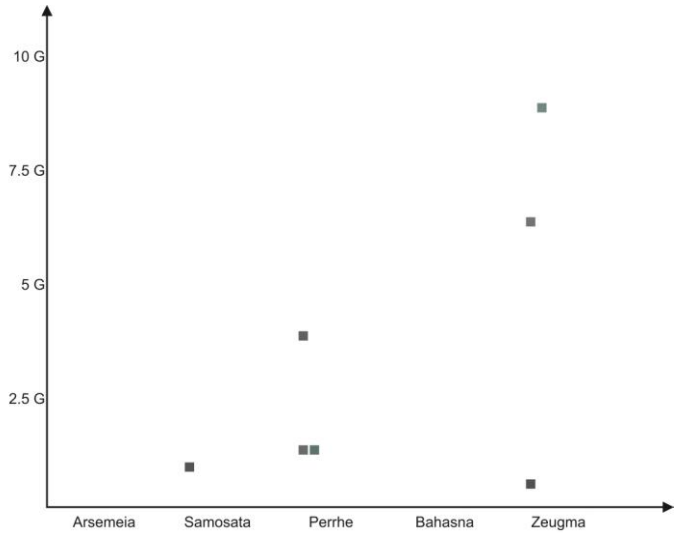


Figure 4.14 Distribution of color chips on green page

Blue-green (BG) page only has chips from Samosata and Perrhe locations. This may be related to use of a local source found in Adıyaman. On the contrary blue page (B)

only has one chip detected from Zeugma, no other chips from this page has been measured. This explains use of smalti in Commagene region. Hellenistic Period mosaics such as Samosata and Arsameia lack use of blue, green colors whereas Roman period mosaics show exquisite examples and mastery with new materials such as smalti to replace missing color values. Thus; it may be stated Commagene Region lacks blue, green stones and instead of borrowing those from neighboring locations, artists create their own tesserae made of glass with vivid and dynamic colors.

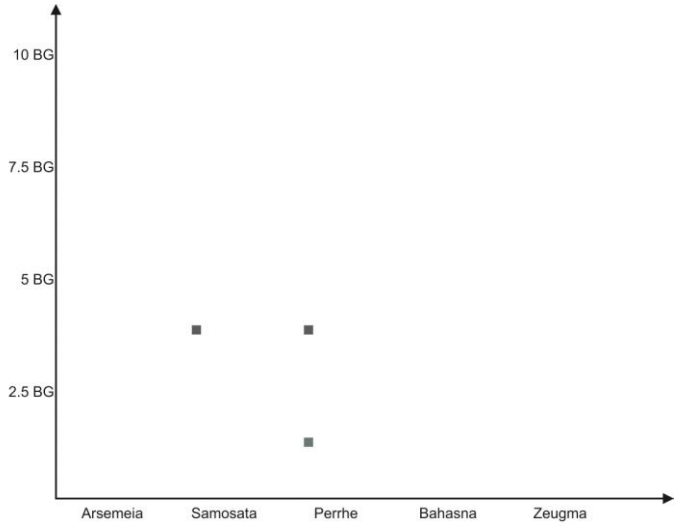


Figure 4.15 Distribution of color chips on blue-green page

Figure 4.16 Distribution of color chips on blue page

Purple-Blue (PB) page has three chips from Zeugma and Perrhe. Two chips are from around 7.5-10 PB area which might be obtained from same source. Along these, one additional chip provided from Zeugma in 2.5 PB areas.

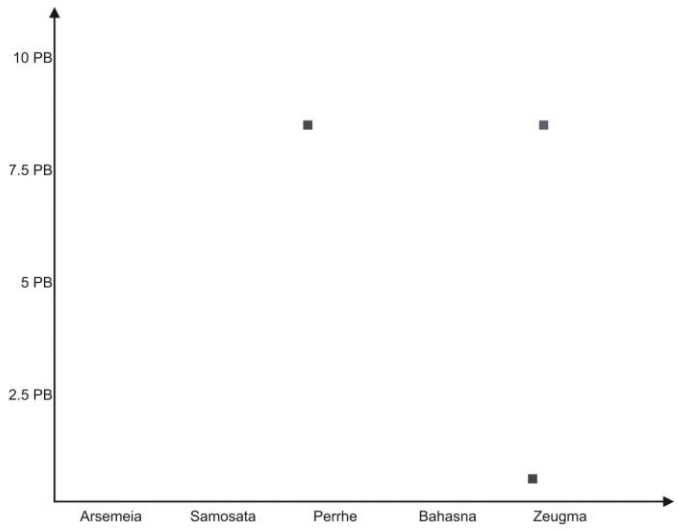


Figure 4.17 Distribution of color chips on purple-blue page

According to color graphs Commagene Region mosaics highly contain tesserae from Y and YR pages which points at local sources in the region. Zeugma mosaics are rich with color chips compared to Samosata and Perrhe. However it should be noted, density was the determining factor of mastery in Samosata mosaics which was highest in all mosaics investigated. These typical Hellenistic examples contained 13 color chips. Perrhe mosaics contain more color chips (35 color chips); density is lower than Samosata and Zeugma. Zeugma mosaics include highest number of color chips (44 color chips) and density of tesserae is higher than Perrhe mosaics from Roman Period mosaics. Artists created realistic images with stone, by using tones of same hue which may be considered as determining factor of mastery. Color catalog obtained from the results of this study are presented in Appendix A.

Tesserae shapes and sizes are the last measured variables of this study. The aim in the study was to set a classification of tesserae shapes used in ancient mosaics. Seven distinguished shapes were detected from morphological classification (Figure 4.18).

Figure 4.18 Shape classes of tesserae

In this classification grouping was done manually in computer regarding the shapes of tesserae. Ancient mosaics contain tesserae cut by hand with tools, results with imperfect shapes; therefore; shapes detected in this study are not perfect squares or trapezoids etc. Amorphous group includes distorted and irregular tesserae, still it should be noted majority of tesserae belonged to geometric shape groups. Mosaic with Fishes from Samosata contains significantly highest amount of amorphous tesserae compared to other mosaics. It was an expected result since mosaic includes smallest size of tesserae and highest density among all mosaics. However, Zeugma mosaics with second highest density still reveals lower amounts of amorphous tesserae. It is a fact, border areas contains few amorphous tesserae which should not be compared to figurative areas of Zeugma mosaics. For instance Chequerboard Mosaic (Corpus No 4) did not contain any amorphous shapes (Figure 4.21). Another point is, classification of shapes is valid for all the examples from different periods including, Hellenistic, Roman and Byzantium Periods.

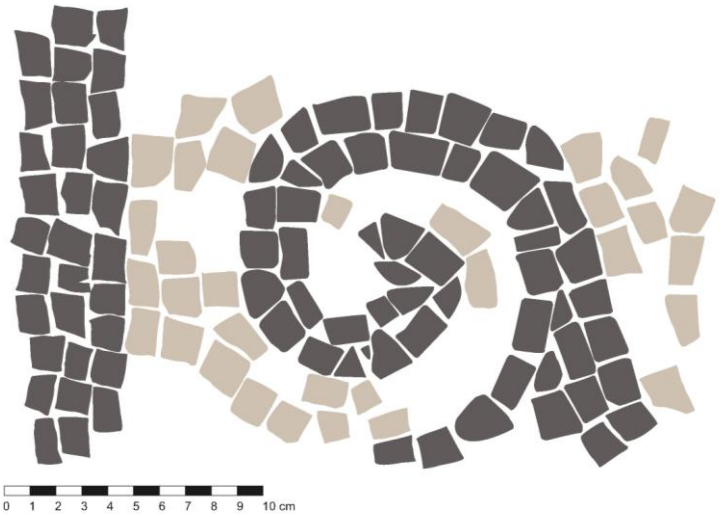


Figure 4.19 Use of triangles, parallelograms and trapezoid

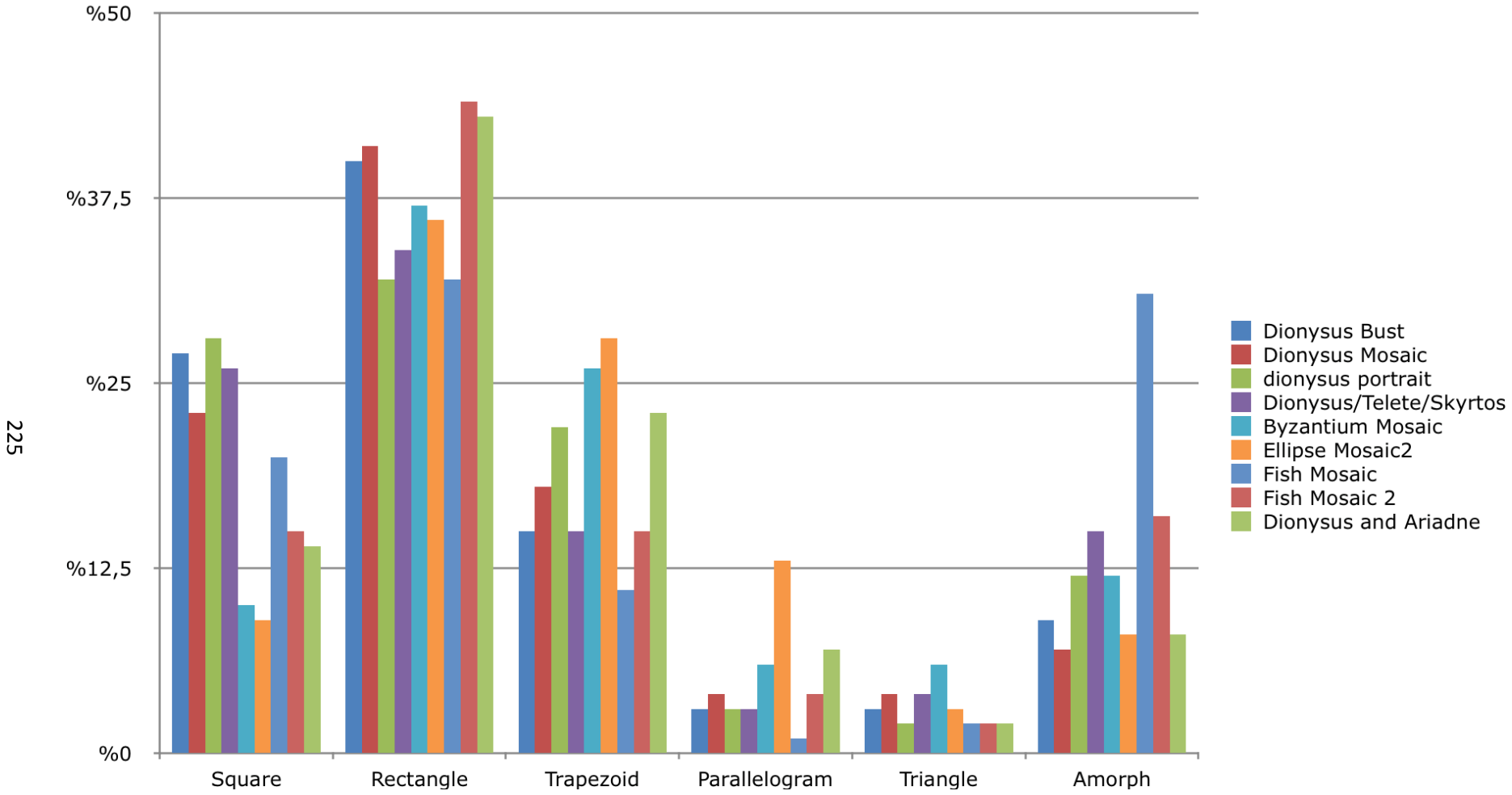


Figure 4.20 Tesserae shape distribution of figurative mosaics

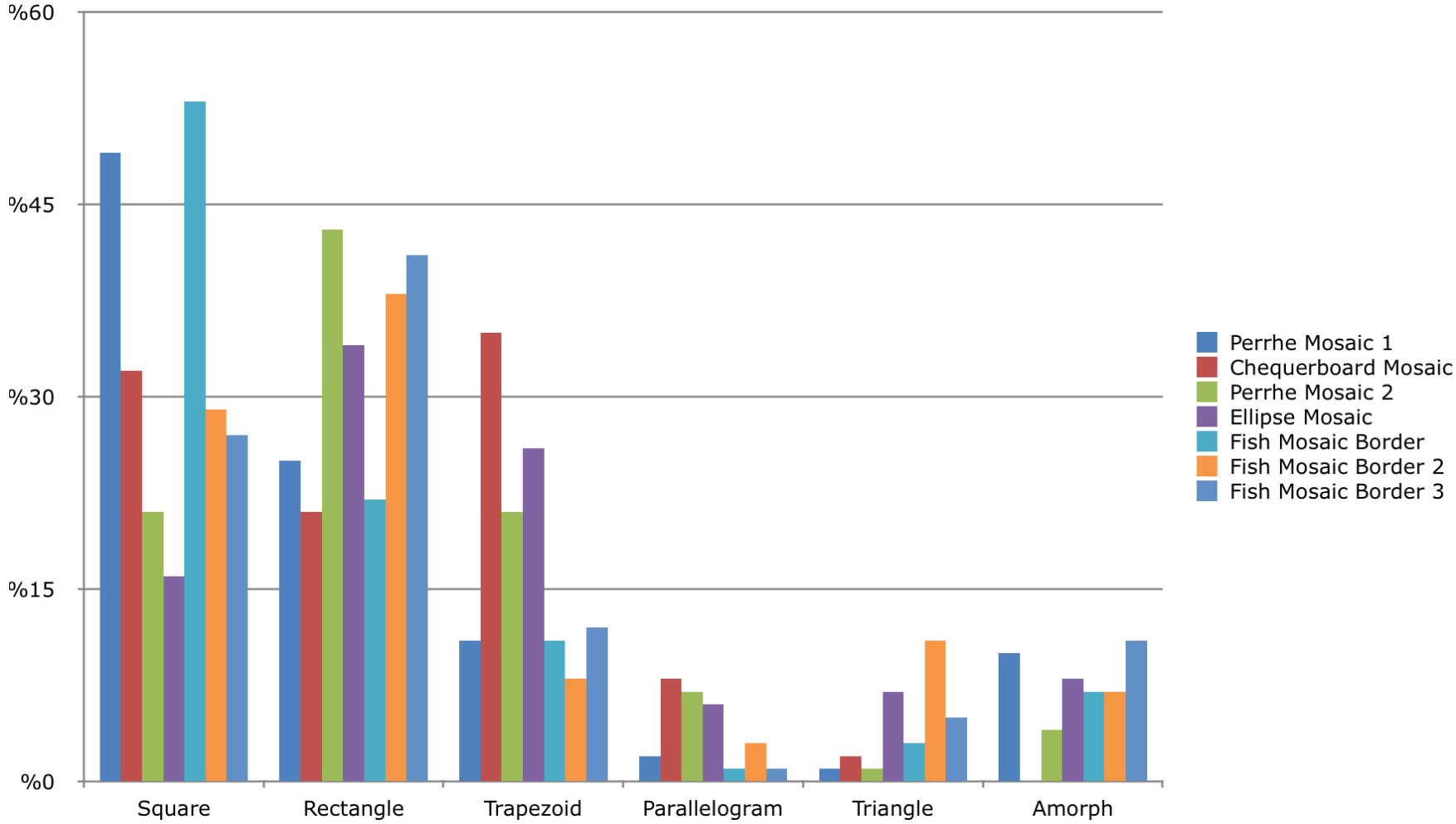


Figure 4.21 Tesserae shape distribution of texture mosaics

Square and rectangle may be associated with the use of opus tessellatum and mainly preferred in borders and background; however it is still related to the motif used in the border. For instance three different parts from border of "Mosaic with Fishes" gave different amounts of square percentages since all had different motifs (Corpus No 3b, 3c and 3d; Figure 4.21). All Zeugma mosaics had similar amounts of squares, whereas facial expressions and small figures had less use such as Byzantium Mosaic (Corpus No 6) and Ellipse Mosaic (Corpus No 10a). Rectangle or square use has indirect relationship. Mosaics where square is used at highest rates also had lowest percentages of rectangle use (Perrhe Mosaic 1, Chequerboard Mosaic and Fish Mosaic Border 3b). Rectangle use is above 20% percent in all mosaics, even higher in figurative examples and can be considered as most preferred shape in ancient mosaics followed by square. Mosaics where opus vermiculatum was employed results with use of shapes as trapezoids, parallelograms and triangles to depict figures or roundel shapes desired (Figure 4.19). Trapezoid use is almost similar to square in figurative examples. Triangle and parallelogram use is limited compared to other shapes. It can be said those shapes were cut intentionally where they were needed, therefore they are less than other shapes but still exist (Figures 4.20 and 4.21).

Figure 4.22 Definitive piece from "Mosaic with Fishes"

Last shape definitive piece is found in some mosaics to express the eye of the figures. It is possible to design eyeball with a single square tesserae or with more than one, but in some mosaics, artists preferred to express eyeball with one single roundel shape. It may not seen as a common behavior in Roman or Hellenistic era since it is seen in some mosaics only, therefore most probably it indicates artist's special way of expression (Figure 4.22). This way of expression is seen in four mosaics from different locations: Mosaic with Fishes from Samosata, Ellipse Mosaic from Perrhe and Dionysus Mosaic and Dionysus Bust from Zeugma mosaics.

Figure 4.23 Sample Tesserae 1 (ST1) (Y. Tanrıverdi, 2015)

Last part of this chapter is on X-ray diffraction (XRD) analysis of samples selected from Perrhe; no other samples from Zeugma and Samosata were attainable to make comparison between settlements. Mosaic samples for mineralogical analyses by X-ray diffraction were selected based on texture and color characteristics. Along with dominant pinkish white and grey colored carbonatic rocks (limestone and dolomite) unique colored ones such as blue, red and green were selected for XRD analysis. Red tessera was the only sample from red page of Munsell systems. Blue and green were also rare chips found in Commagene Region.

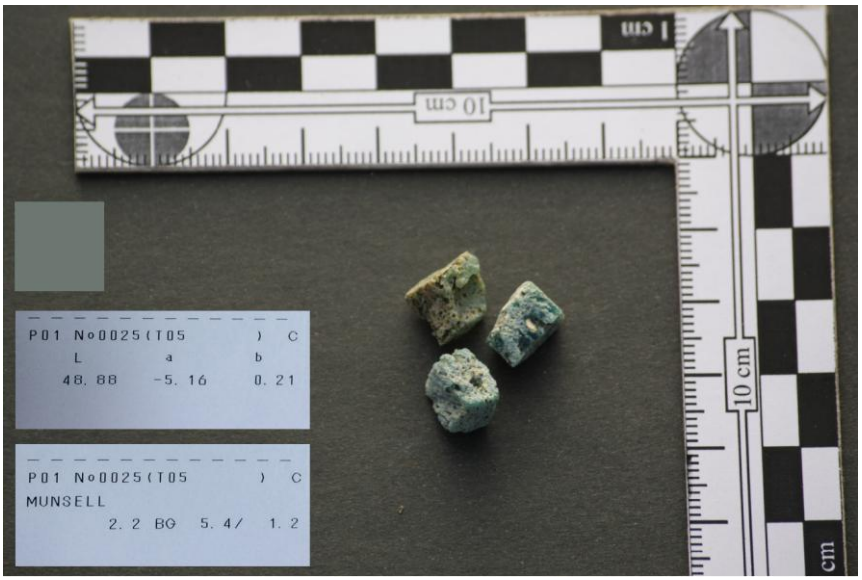


Figure 4.24 Sample Tesserae 18 (ST18) (Y. Tanrıverdi, 2015)

Figure 4.25 Sample Tesserae 19 (ST19) (Y. Tanrıverdi, 2015)

Samples were ground into silt size for powder diffraction (Jackson, 2005) and reading was recorded between 5-70 (2θ) with Cu-lamp. Samples ST1 (green), ST18 (blue) and ST19 (red) when ground into silt size they yielded glass fractures (Figures

4.23, 4.24 and 4.25) whereas samples ST22, ST28 and ST29 (Figures 4.26, 4.27, and 4.28) had stone dust texture.

Figure 4.26 Sample Tesserae 22 (ST22) (Y. Tanrıverdi, 2015)

Figure 4.27 Sample Tesserae 27 (ST27) (Y. Tanrıverdi, 2015)

Samples ST1, ST18 and ST19 revealed amorphous shoulder pattern which is common for amorphous materials (Figure 4.29, 4.30 and 4.31). The shoulders concentrated around 28-30 (2θ) might be due to glass content of the samples which is

also defined in other studies (Yu et. al., 2009; Zheng et. al., 2012; Figure 4.32). The degraded peaks of the samples may be due to the weathering of artifacts (Garcia et al. 2003).

Figure 4.28 Sample Tesserae 29 (ST29)(Y. Tanrıverdi, 2015)

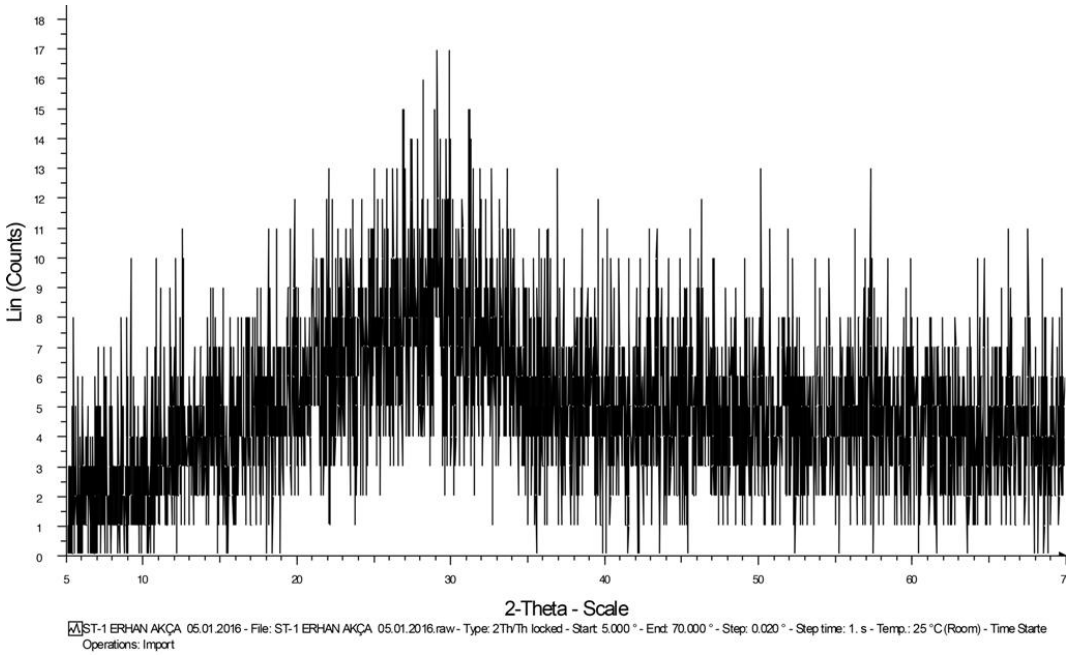


Figure 4.29 The XRD pattern of ST1. The amorphous peaks between 26-32 (2θ) might be due to glassy structure.

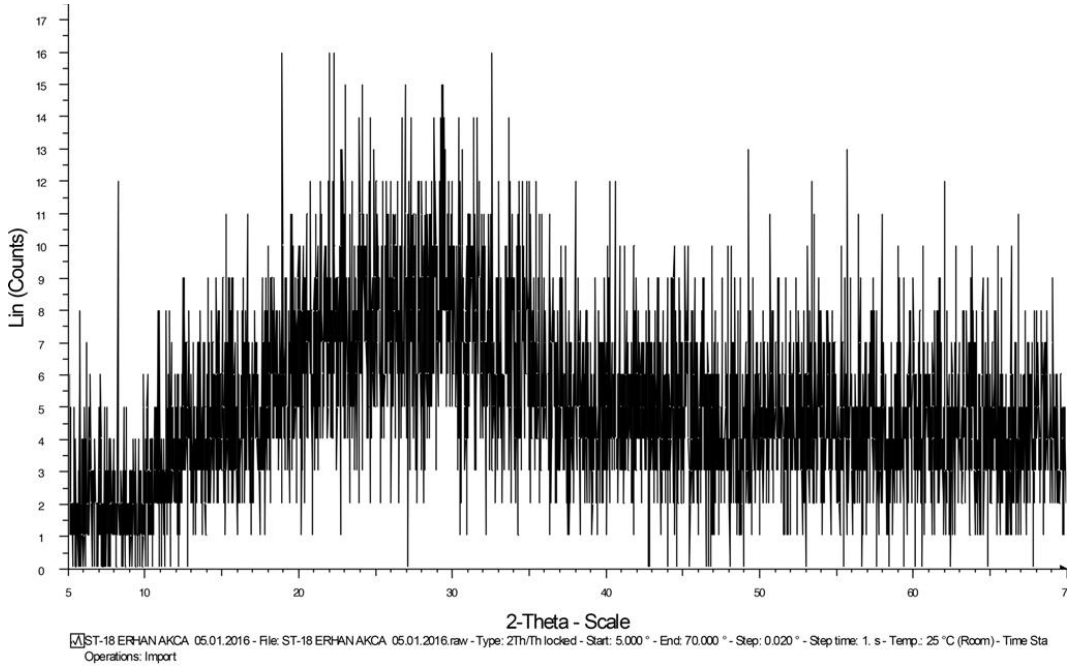


Figure 4.30 The XRD pattern of ST18. The amorphous peaks between 26-32 (2θ) might be due to glassy structure.

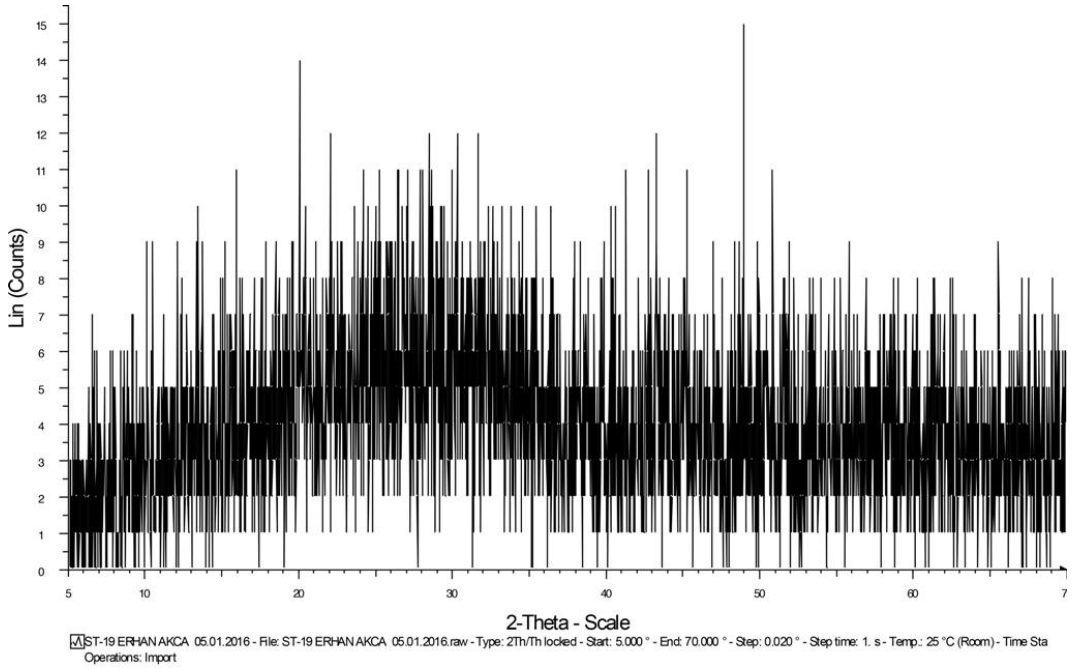


Figure 4.31 The XRD pattern of ST19. The amorphous peaks between 26-32 (2θ) might be due to glassy structure.

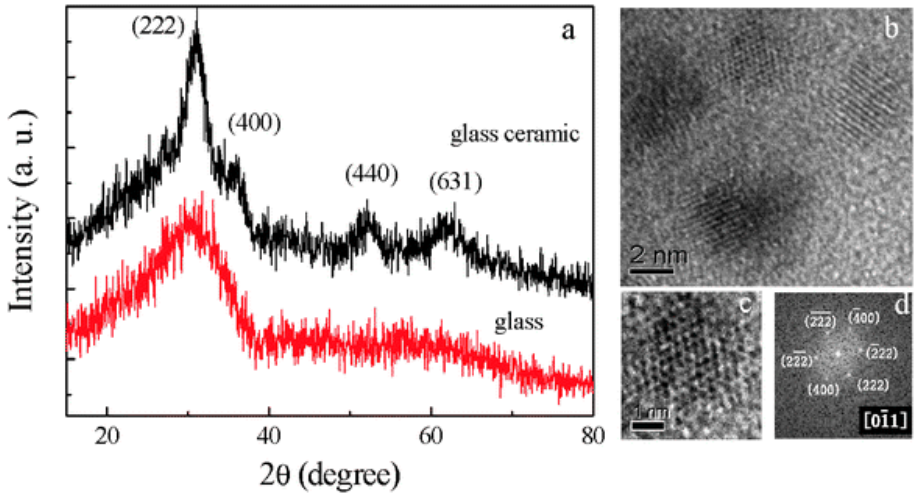


Figure 4.32 The XRD pattern of glass ceramic and glass with amorphous peaks (Yu et al. 2009).

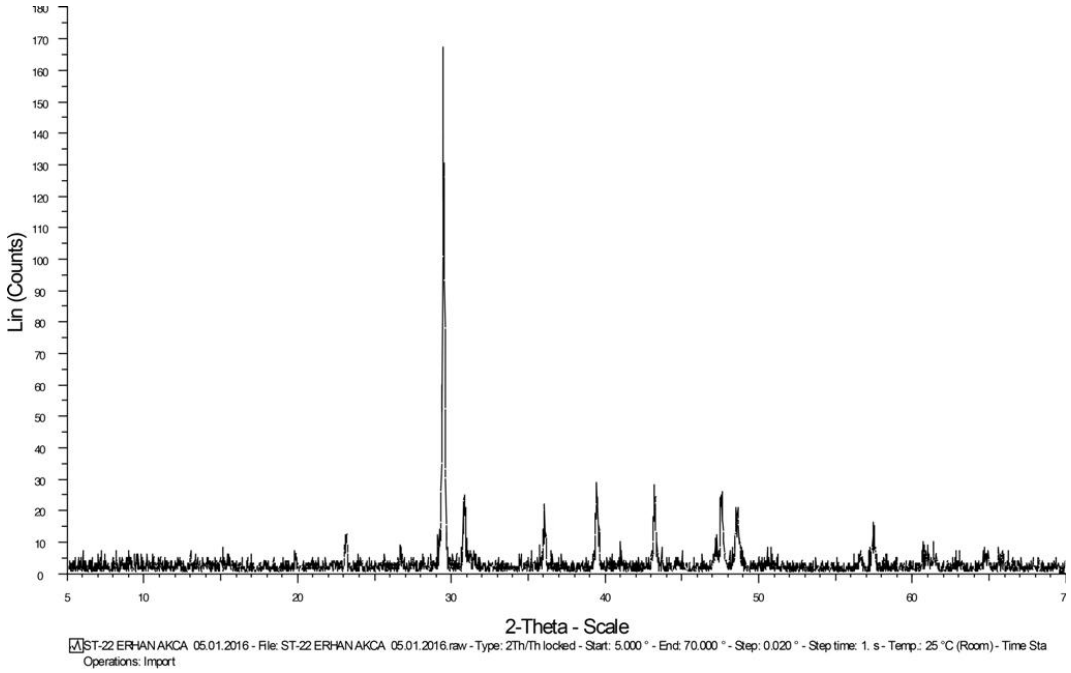


Figure 4.33 The XRD pattern of ST22, see the sharp and dominant XRD peak at 29.44 (2 theta)

Samples ST1, ST18 and ST19 were unique tesserae in terms of color. As seen in color study, those colors were rare in mosaics and artists mainly preferred use of smalti instead. Therefore in congruent with XRD results, these samples might be glass tesserae produced in Perrhe mosaic workshops. Samples ST22, ST27, ST29

revealed a sharp and dominant peak at 29.44 (2θ) which is 2.99Å (Figures 4.33, 4.34 and 4.35). This is a very distinctive peak of calcite which may be also seen in other studies (Figure 4.36).

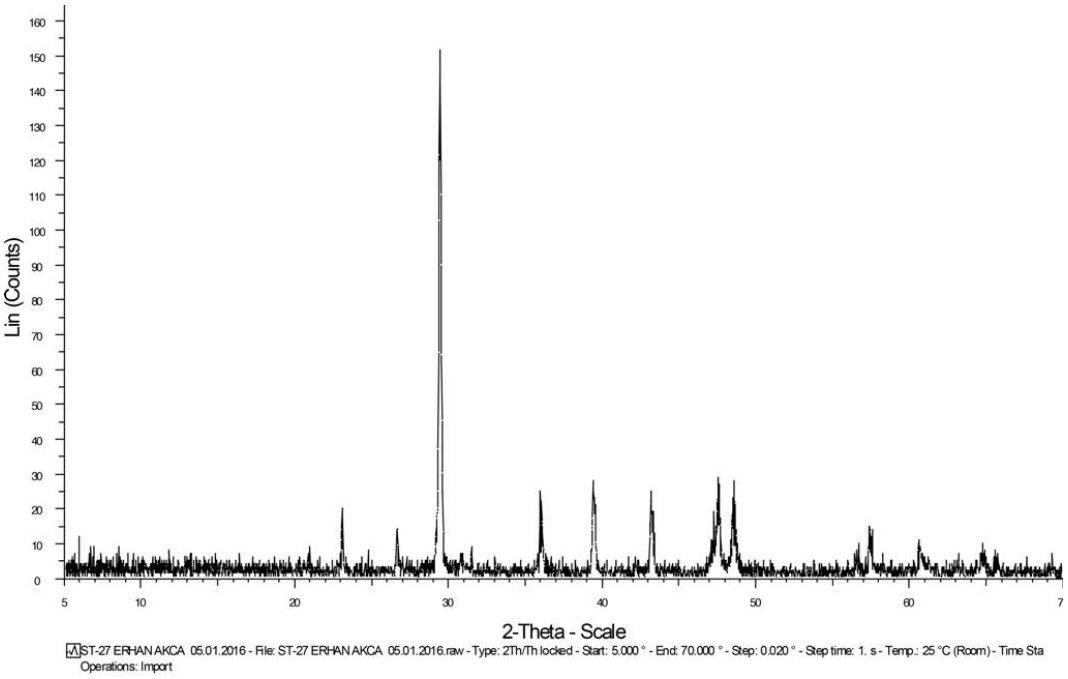


Figure 4.34 The XRD pattern of ST27, see the sharp and dominant XRD peak at 29.44 (2 theta)

The color variations in limestone tesserae of mosaics are most probably due to oxidation of insoluble residues in limestone that are mainly ferrous and clay minerals (Yaalon, 1997). For rock samples XRD analysis revealed sound results for defining the source material however for glassy material further chemical analysis is needed for defining color differences which were developed due to elemental impurities of cobalt and copper (Newton 1978).

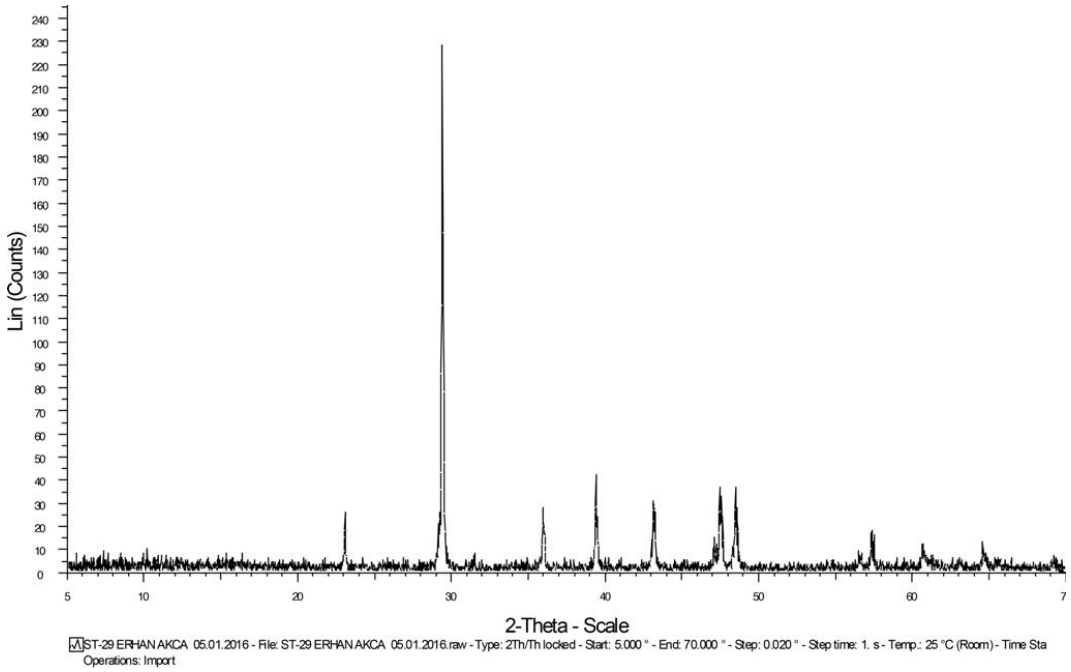


Figure 4.35 The XRD pattern of ST29, see the sharp and dominant XRD peak at 29.44 (2 theta)

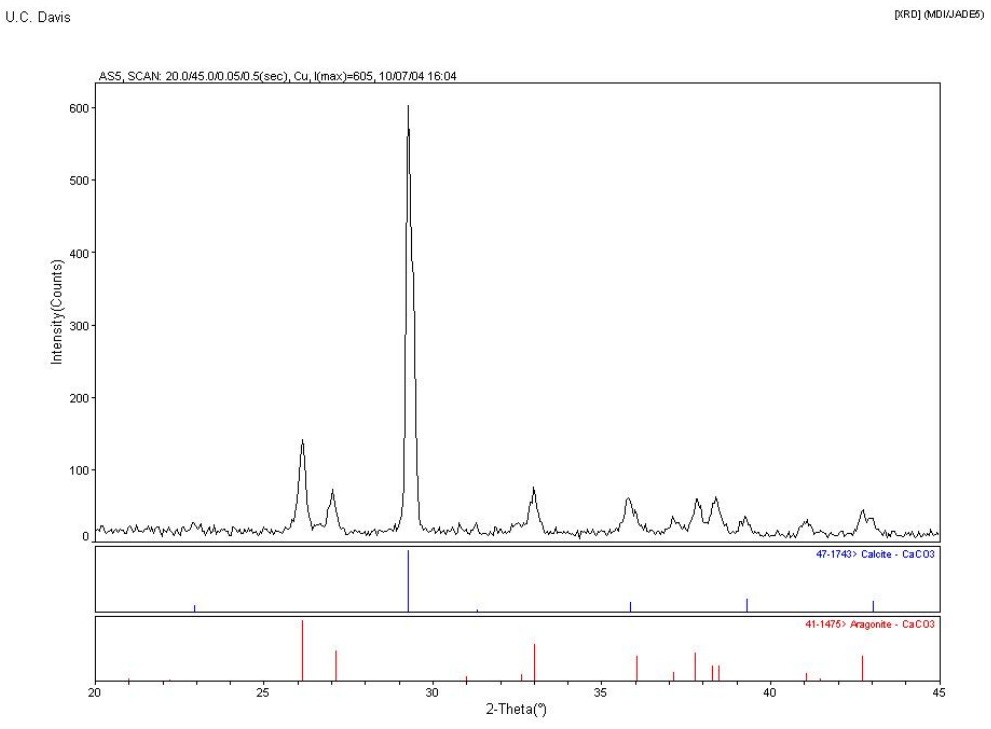


Figure 4.36 The XRD pattern of calcite mineral (http://classic.geology.ucdavis.edu/classes/gel281/F04/results/xrd/AS5.html)

CHAPTER 5

CONCLUSION

Mosaics are among the most remarkable forms of art as they are survived from antiquity with their unique design and vivid colors used as decoration and finishing materials. Along providing luxurious and smooth finishing and especially refreshing floors for hot climates; these decorative and functional surfaces also allow various disciplines to gather and work on different aspects of them. Disciplines of archeology, architecture, archeometry, geology, mineralogy, art history manage to conduct research on materials and elements used during production, architectural contexts they belong to, the techniques of mosaic making, or mythological scenes depicted.

Even so, there is a strong division of approach on research field of mosaics. Researches are either qualitative studies on meaning, themes, subjects and figures of mosaic; or quantitative studies on materials and minerals; corrosion and protection of mosaics. Both quantitative and qualitative studies did not sufficiently focus on other disciplines' methods while investigating mosaics. Thus, this study aimed to make an attempt to work on closing the gap between qualitative and quantitative studies and propose an archeometric quantified morphological and mineralogical approach on tesserae of ancient mosaics regardless of style or theme. It should also be mentioned focus and investigations were done from point of view of an interior designer which indicates the fruitful field of mosaics for interdisciplinary researches.

The study was conducted on ancient mosaics from Commagene Region (Southeast of Modern Turkey). Euphrates River and its branches was main advantage of this zone and motive for settling in region since ancient times. Another advantage of the river was stones transported from various rock sources on its course to Commagene region

that may preferred for mosaic production. Mosaic centers in Commagene Region were namely Arsemeia, Samosata, Bahasna, Perrhe and Zeugma. During the investigation of Commagene Region mosaics, color and tesserae traits such as size and shape were taken as two main criteria. Firstly, a catalog suggested as an identification card for each mosaic and in the light of literature, information on those mosaics was collected. Catalogs include mosaics did not survive today such as Arsemeia mosaics as well to indicate most reiterated motifs and colors of tesserae used in that settlement. Arsemeia gave few mosaic examples date back to Late Hellenistic Period made with opus tessellatum technique. The bead-reel motif was only seen in Arsemeia mosaics of Commagene Region. Along this motif, waves, turreted wall, crow step, meander and pyramidal crow step were observed. Samosata mosaics included waves, crow step, meander and pyramidal crow step similar to Arsemeia. Excavations for Perrhe mosaics currently continue, therefore only some of the mosaics were reachable. Investigated mosaics revealed meander, guilloches, zigzag motif and occasionally rosette and equilateral triangles as common motifs used in Perrhe. Those are similar to Zeugma mosaic motifs among other settlements of Commagene. Bahasna mosaics were few; only two mosaics were introduced in the study. Meander, intersecting circles and equilateral quadrangles were noted as common motifs which were alike Perrhe and Zeugma examples. However; it should be noted in Zeugma and Perrhe, motifs were just to frame the central panel, whereas in Bahasna centers of mosaics were unknown and motifs were significantly bigger than Zeugma and Perrhe. Zeugma was the richest settlement in terms of motifs variety. Common motifs were waves, crow step and guilloches and meander. Meander was the only motif reiterated in all settlements. Wave, crow step, guilloches, pyramidal crow step, equilateral quadrangle, intersecting circles and zigzag patterns were found more than one settlement.

Tesserae size and density (amount of tesserae per dm^2) measured for each mosaic was other variables compared between settlements. According to results, smallest tesserae and highest density were observed in figurative part of Mosaic with Fishes' from Samosata which was one of the finest examples from Samosata Palace and followed by Zeugma mosaics. Despite this; difference between border tesserae sizes and figural part's of Mosaic with Fishes was slightly highest. Its border's density was

lowest following Chequerboard mosaic which was just a functional corridor mosaic without aesthetical concerns. Therefore if tessera size is considered as an indication of fine work, borders was not an important part of design in Hellenistic Period Samosata; therefore artists showed their mastery in the central panels of these mosaics. This is valid for Arsemeia mosaics as well; since, its tesserae size was up to 3 cm in borders and in central panel it went down to 0, 5 cm which is incongruent with Samosata.

In Zeugma figurative parts were depicted with significantly smaller tesserae compared to other parts forming the scene and borders. Density of these mosaics was higher than Perrhe mosaics which might be accepted as a result of mastery. Only Dionysus Medallion showed lower rates of tesserae amount among other Zeugma mosaics studied.

Density rates of mosaics might be taken as indication of different periods, or demonstrations of mastery. All Zeugma mosaics investigated owned tesserae more than 185 in figurative areas. Dionysus Bust carried almost 300 tesserae in its figurative part which is highest amount in Zeugma mosaics. Investigated Perrhe mosaics were mostly from borders which may be a fact of low density rates. Still Ellipse Mosaic was from an apse of a building and contained lower than 100 tesserae per dm^2. Therefore density and mastery relation in Perrhe mosaics would be understood better when new mosaics from current excavations are investigated.

Additionally a classification for tesserae shapes was proposed in this study. According to most reiterated shapes, seven groups were detected by morphological classification. First group included square tesserae and shapes close to square. Second group contained rectangles which are commonly seen in mosaic samples. Third and fourth groups had trapezoids and parallelograms and shapes similar to them respectively. Fifth group comprised less tesserae compared to other groups with triangles. Sixth group was amorphous shapes and contained irregular along with altered tesserae. Last classification group was definitive piece included roundel tesserae used for specific delineations such as eyeball in some mosaics.

Classification of tesserae was done manually in computer based on morphological features. For future studies a new or modified software may be proposed to classify

tesserae more accurately in computer as an interdisciplinary study on mosaics. However it should be kept in mind ancient mosaics contain tesserae cut by hand tools, results imperfect shapes; therefore; shapes detected in this study are not perfect squares or trapezoids and so on. Still even in mosaics with smallest tesserae there was a shape classification and only some pieces were considered as amorphous most probably due to weathering or used as filling irregular areas in between well-shaped mosaics. Therefore; these amorphous altered and deformed tesserae might belong to another group before they were distort and corroded.

"Mosaic with Fishes" from Samosata contained significantly highest amount of amorphous tesserae than other mosaics. It was an expected result since mosaic includes smallest size of tesserae and highest density among all mosaics. However, Zeugma mosaics with second highest density still revealed lower amounts of amorphous tesserae. It is a fact, border areas contained few amorphous tesserae; for instance Chequerboard Mosaic from Samosata did not contain any amorphous shapes. Therefore it may be stated technique employed in the mosaic might be related to tesserae shapes or overall design. When the technique is opus tessellatum, use of squares and rectangles is high. Mosaics where opus vermiculatum was employed results with use of shapes as trapezoids, parallelograms and triangles to depict figures or roundel shapes desired. Rectangle or square use had indirect relationship. Mosaics where square pieces were used at highest rates had lowest percentages of rectangle use. Rectangle use is above 20% percent in all mosaics, even higher in figurative examples and can be considered as most preferred shape in ancient mosaics followed by square. This may be due to ease of production of rectangle pieces. Triangle and parallelogram use was limited compared to other shapes. It can be said those shapes were cut intentionally where they were needed, therefore they are less than other shapes but still exist.

Definitive piece was found in some mosaics to delineate eye of the figures. Nevertheless, not in all but in some, artists preferred to express eyeball with one single roundel shape. Thus; it may not seen as a common behavior in Roman or Hellenistic era, most probably it indicates artist's special way of expression or indication of a local workshop style. Definitive piece was seen in Mosaic with Fishes

(Samosata), Ellipse Mosaic (Perrhe), and in Dionysus Mosaic and Dionysus Bust (Zeugma).

Color study was conducted on Samosata, Perrhe and Zeugma mosaics. Arsemeia mosaics did not survive today and Bahasna mosaics were not attainable for this study. Colors were measured by using chroma meter and recorded as Munsell Color and Lab Color values. For each hue a color chip with Munsell values was proposed in computer. According to results of the study yellow-red and yellow pages contain highest number of chips from all three locations. Samosata color chips are mainly from Y page around 2.5-5Y, Perrhe are from both from Y and YR pages and mostly contain 2.5-5Y values. Zeugma color chips are around 2.5Y and 10 YR. This is due to the limestone use in production.

Green-yellow (GY), green (G), blue-green (BG) and blue pages (B) contain fewer color chips compared to Y and YR pages. That should be related to limited rock sources of blue and green colors which forced artists to produce smalti (glass tesserae) for vivid and dynamic colors. Therefore, Hellenistic Period mosaics such as Samosata and Arsemeia lack use of blue, green colors whereas Roman period mosaics show finest examples and mastery with new materials to replace missing colors. Perrhe samples included highest amount of chips in GY page and only chip from red (R) page as well. This might be a promising result for future studies to research glass tesserae production of Perrhe. However, the glasses used in mosaics are not the products of high technology thus they bear gas holes or impurities. It is better to classify these materials as glass ceramics. This is supported by XRD analysis of red, blue and green colored pieces which gave amorphous peaks in powdered samples.

As results indicated, Zeugma mosaics are richer than Samosata and Perrhe in terms of color. This can be estimated as in different periods artists used different variables as indicators of mastery. For instance, density was the determining factor of mastery in Samosata mosaics which was highest in all mosaics investigated. Perrhe mosaics contained more color chips; density was lower than Samosata and Zeugma. Lastly Zeugma mosaics included highest number of color chips and density of tesserae was

higher than Perrhe mosaics. In Zeugma artists created realistic images with stone, by using tones of same hue which may be considered as determining factor of mastery.

One limitation with color investigation was the shape of chroma meter. Its camera was located at the bottom therefore it was hard to see where it targeted. Sometimes mortar values or some other tesserae close to the selected one were recorded accidentally. For future color studies another device might be selected in order to prevent these kinds of mistakes might occur during the investigation.

Morphological and mineralogical analysis of Perrhe samples contain measured Munsell values which are presented in Color Catalog of the study (Appendix A) and XRD results of six tesserae. A particular detail from morphological investigation was; some of the mosaic pieces were lighter compared to others. Those pieces had thinner mortars, and also small tesserae with significantly small depths. This may be related to where the mosaic was applied to; if it was on ground the mortar should be thicker, if it was applied on wall, both the stones picked and mortar should be lighter. At the same time, this may be associated with indication of mastery. Artists proposed functional solutions along creating aesthetical finishing materials. However in this study it was not possible to compare depth of the tesserae from different settlements due to lack of samples. It would be useful to investigate the depth as a third dimension of size however as cultural heritages mosaics cannot be studied by removing any units from it. Therefore, with adequate equipments such as laser scanners mosaics can be investigated for unknown parameters of tesserae. Use of glass and limestone was supported with XRD results where dominant pinkish white and grey carbonatic rocks revealed a sharp and dominant peak which is a very distinctive peak of calcite, whereas unique colors had amorphous peaks.

It should be also mentioned, for rock samples XRD analysis revealed sound results for defining the source material, but for glassy material further chemical analysis is needed for defining color differences which were developed due to elemental impurities of samples.

To sum up, mosaics are a fruitful research field for various disciplines conducting qualitative and quantitative studies. However the gap between these studies weakens the potential of subject area and hardens to standardize mosaics for those disciplines.

Therefore, proposing a classification for tesserae shapes, linking up tesserae sizes among regions in terms of mastery and style, using density as a factor in comparison and presenting a color catalog for Commagene Region mosaics may be considered as a new quantitative approach on qualitative traits of mosaics. Focusing on these attributes may help documenting mosaics along conservation and preservation researches will be conducted. Proposing a color catalog and tesserae investigation on Anatolia mosaics, may be a new research subject to compare and evaluate similarities and differences between important mosaic centers of the world in terms of material, tesserae traits and color.

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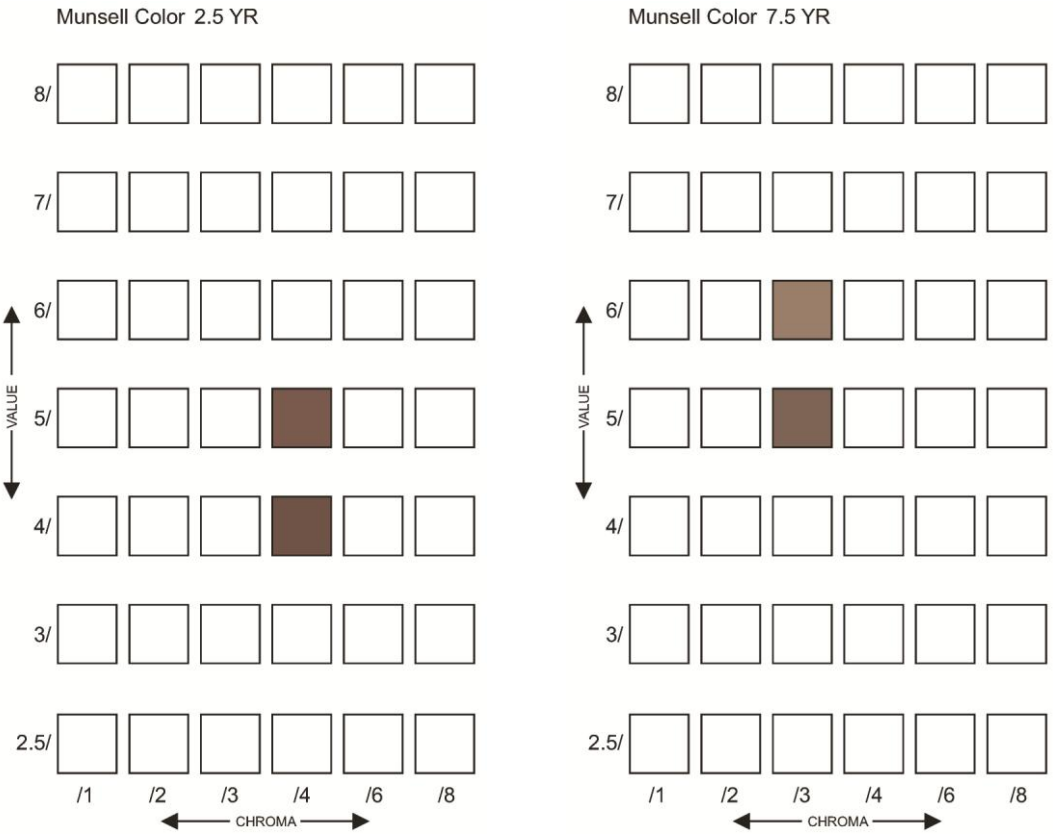
APPENDIX A

COLOR CATALOG

Samosata Color Catalog



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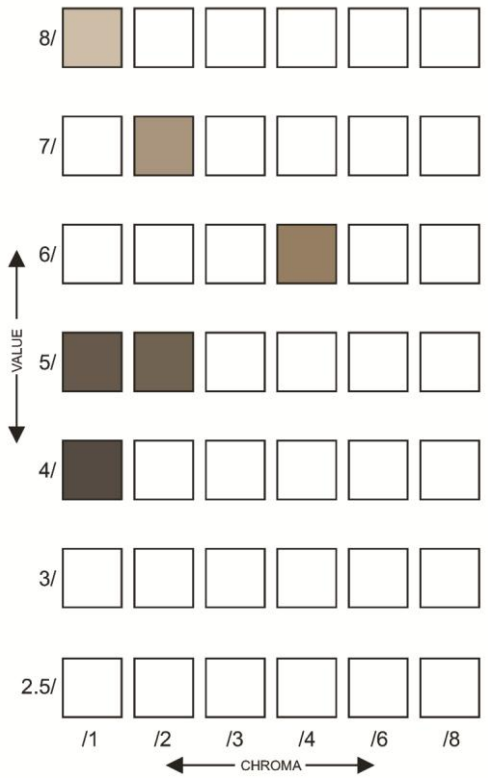

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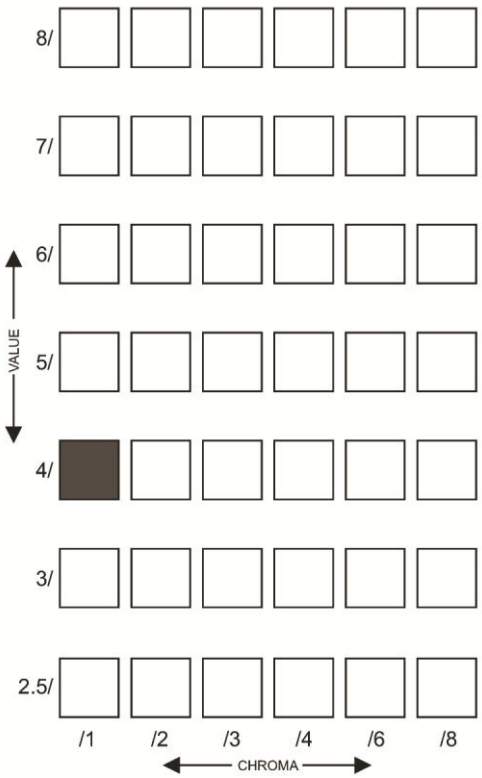

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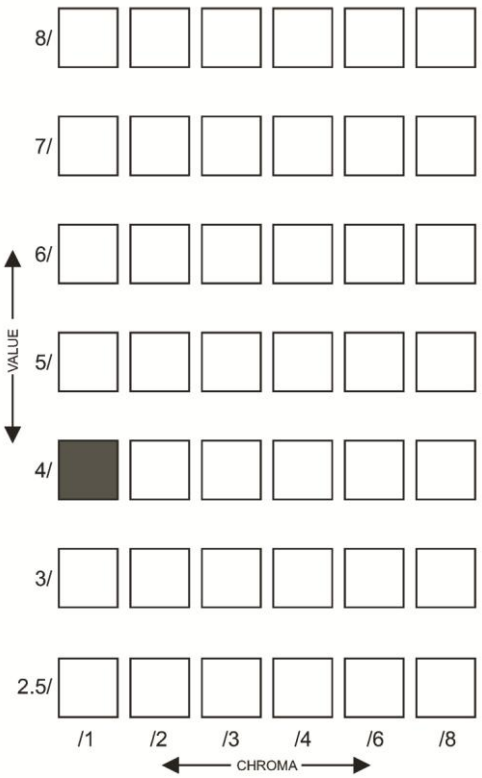

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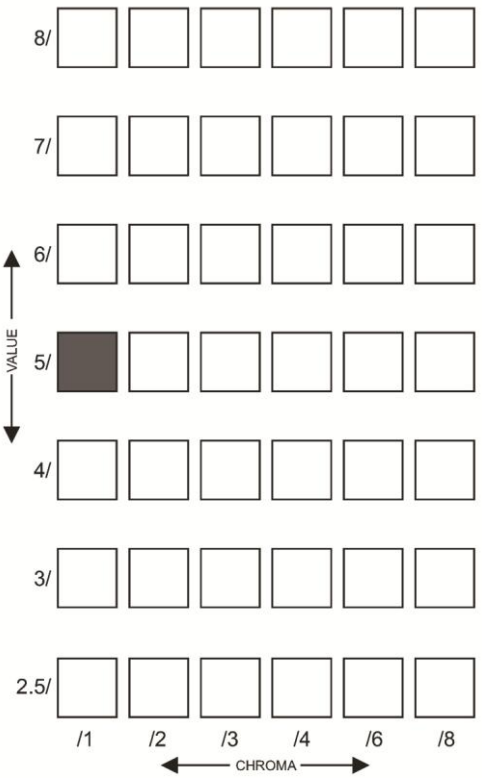

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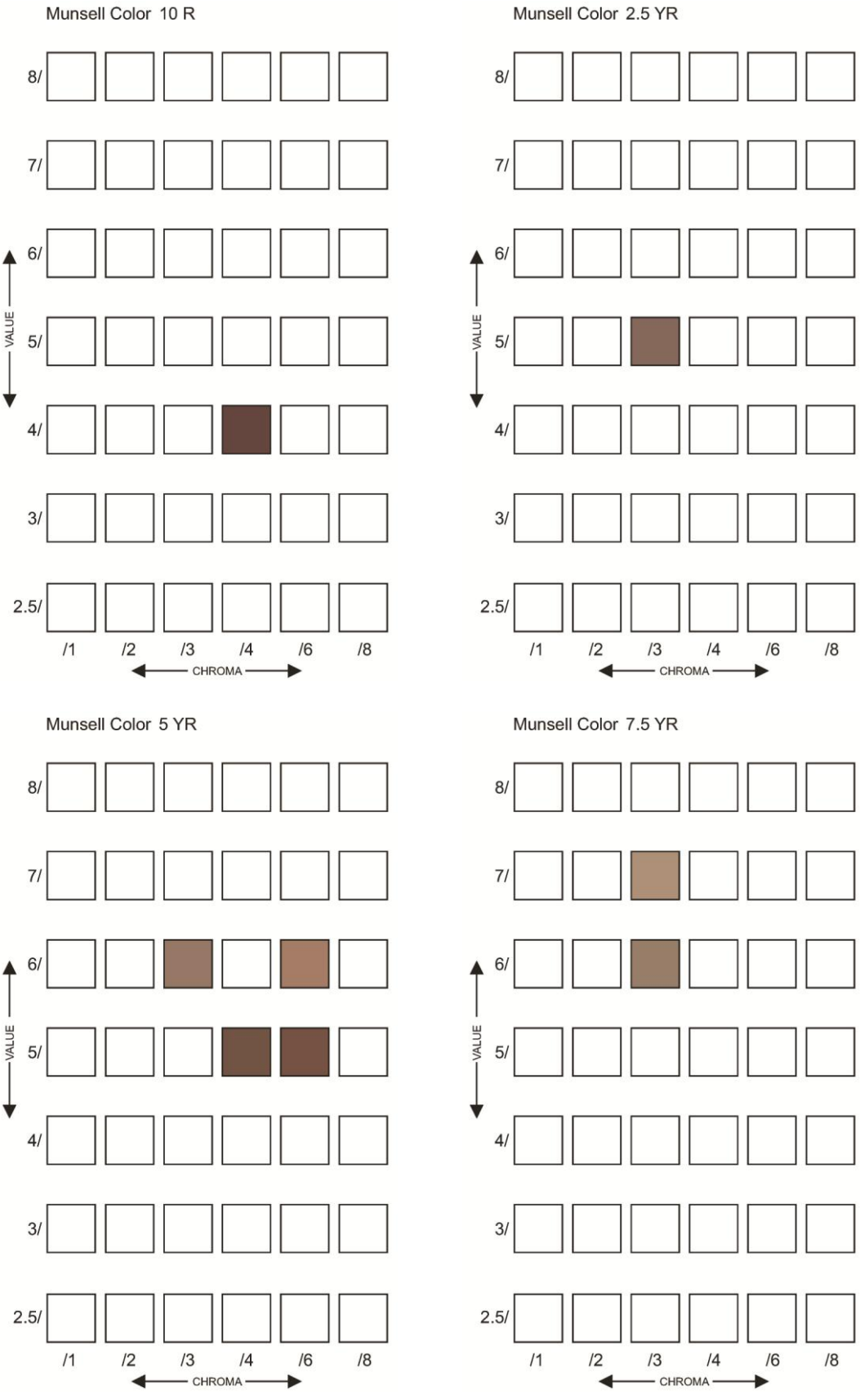

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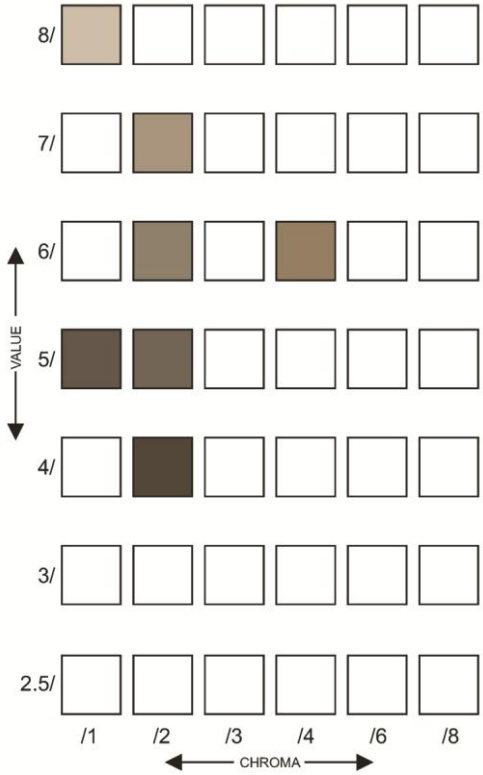

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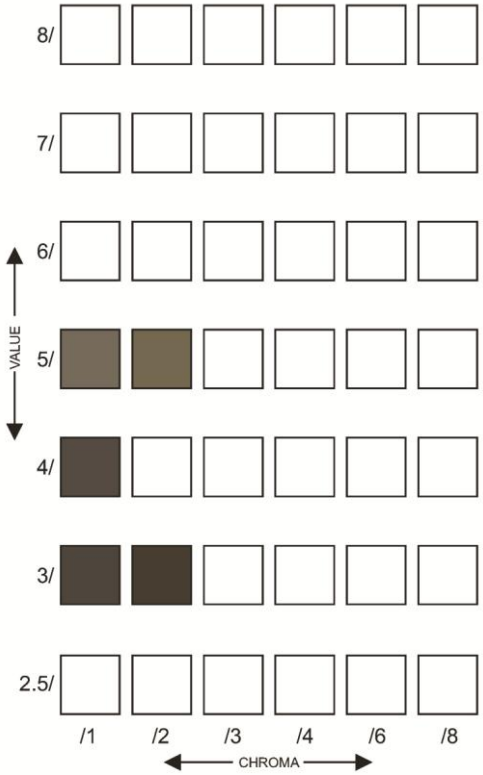

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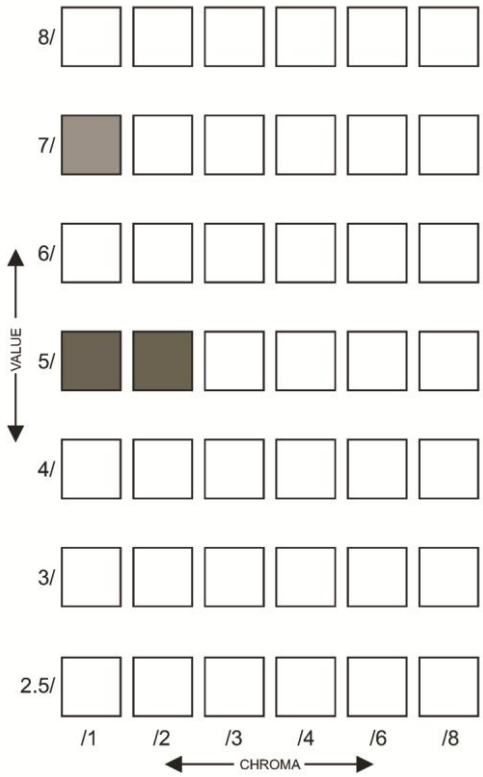

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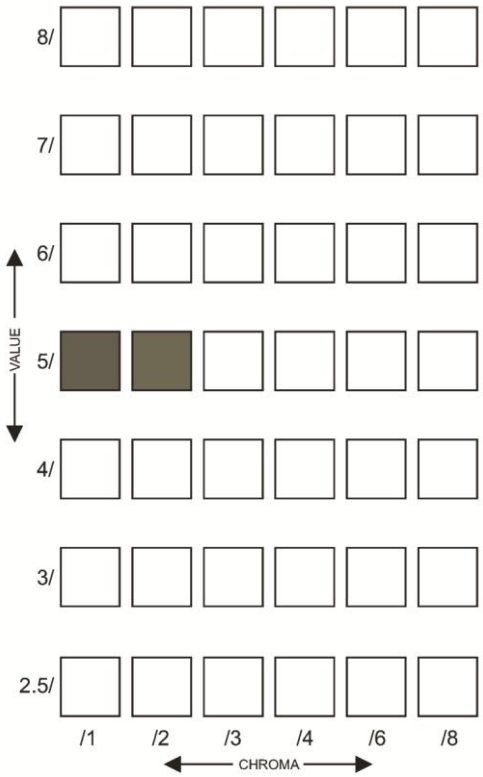

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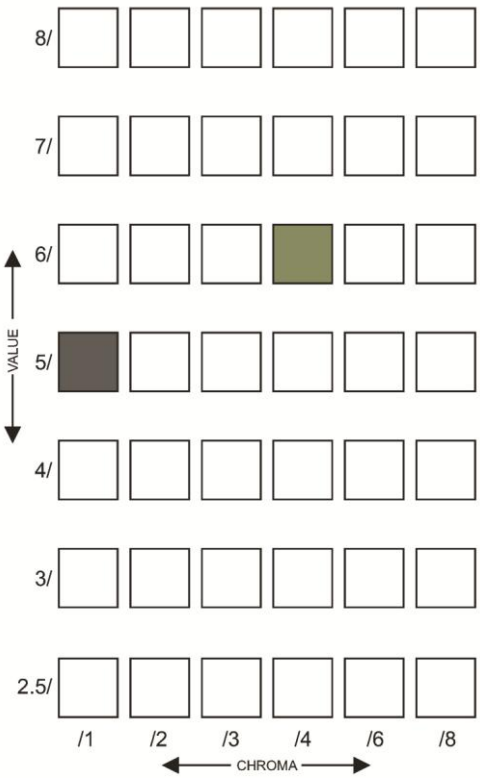

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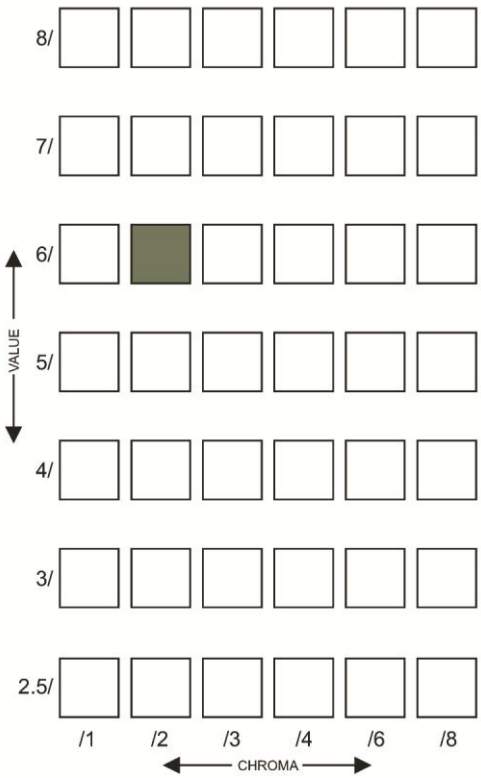

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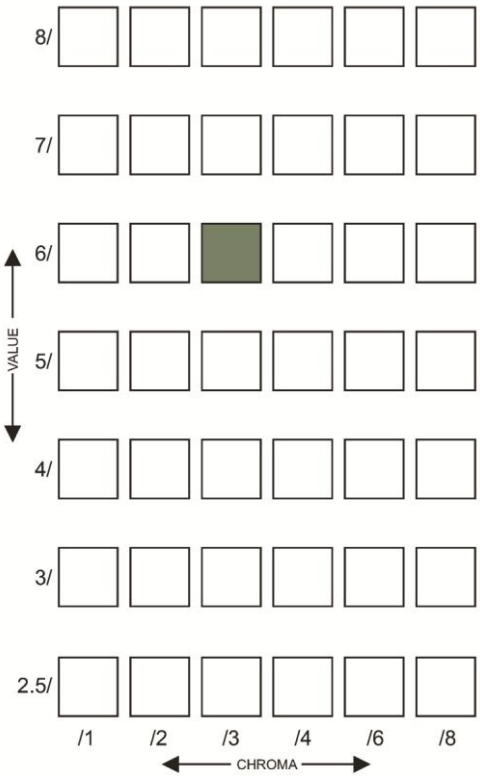

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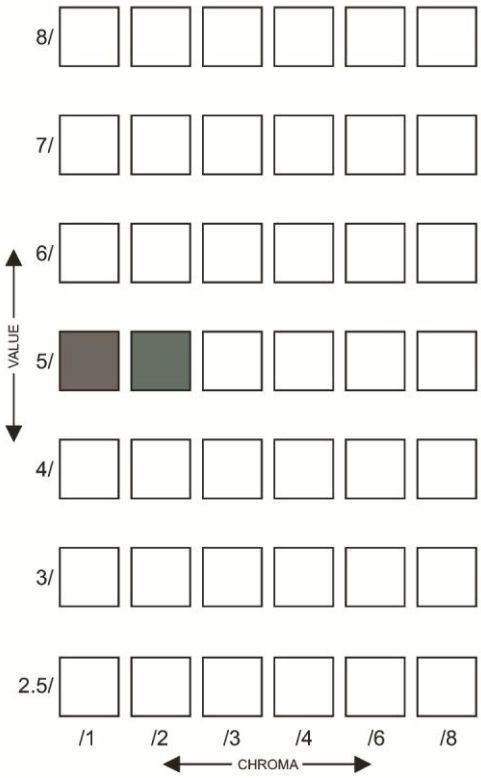

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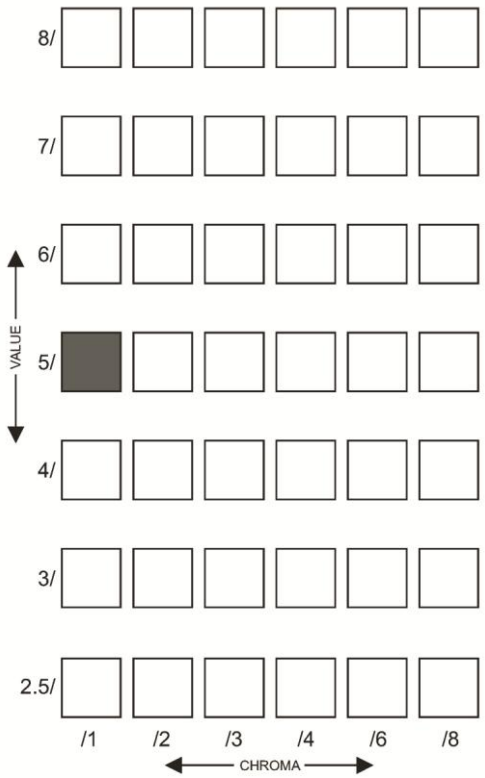

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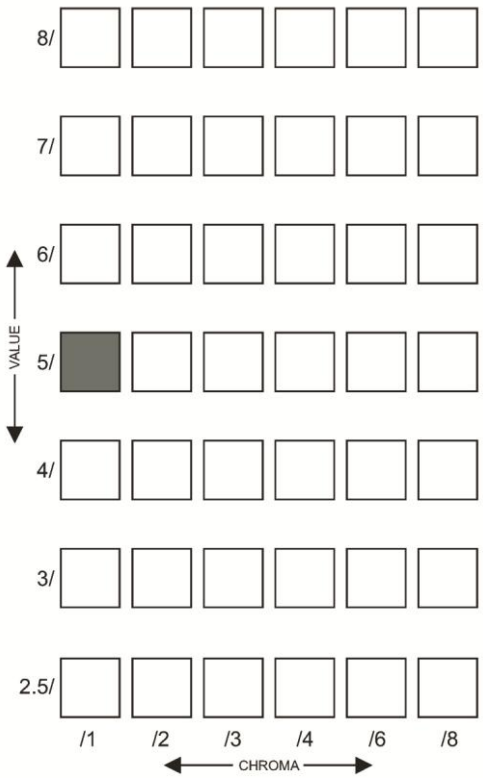

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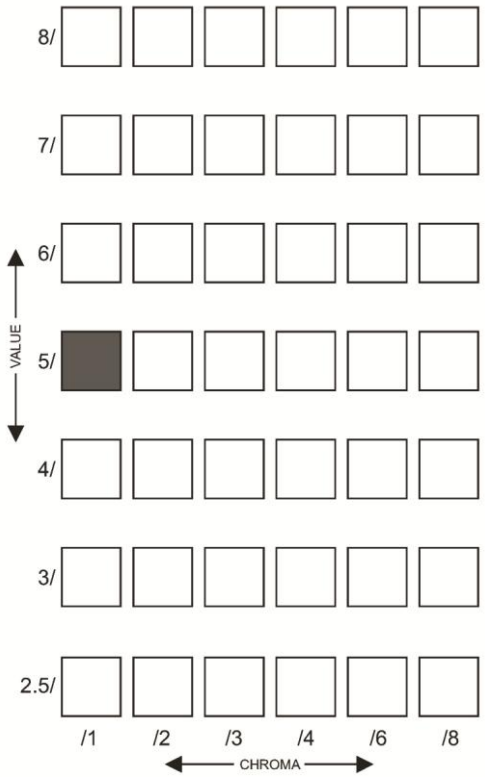

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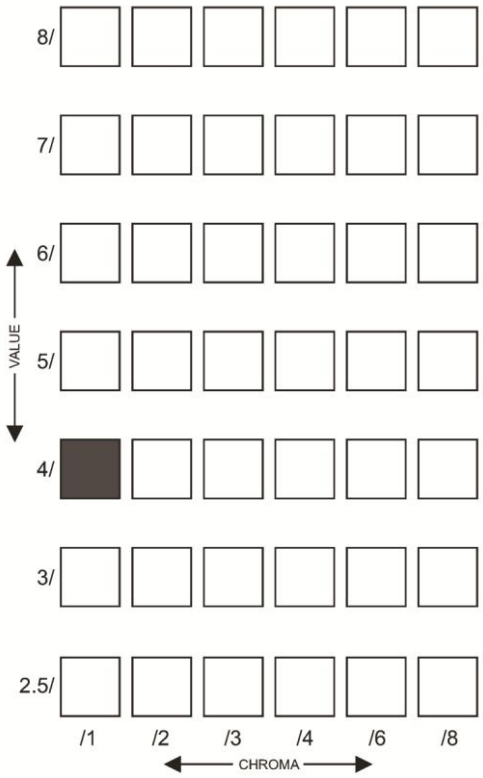

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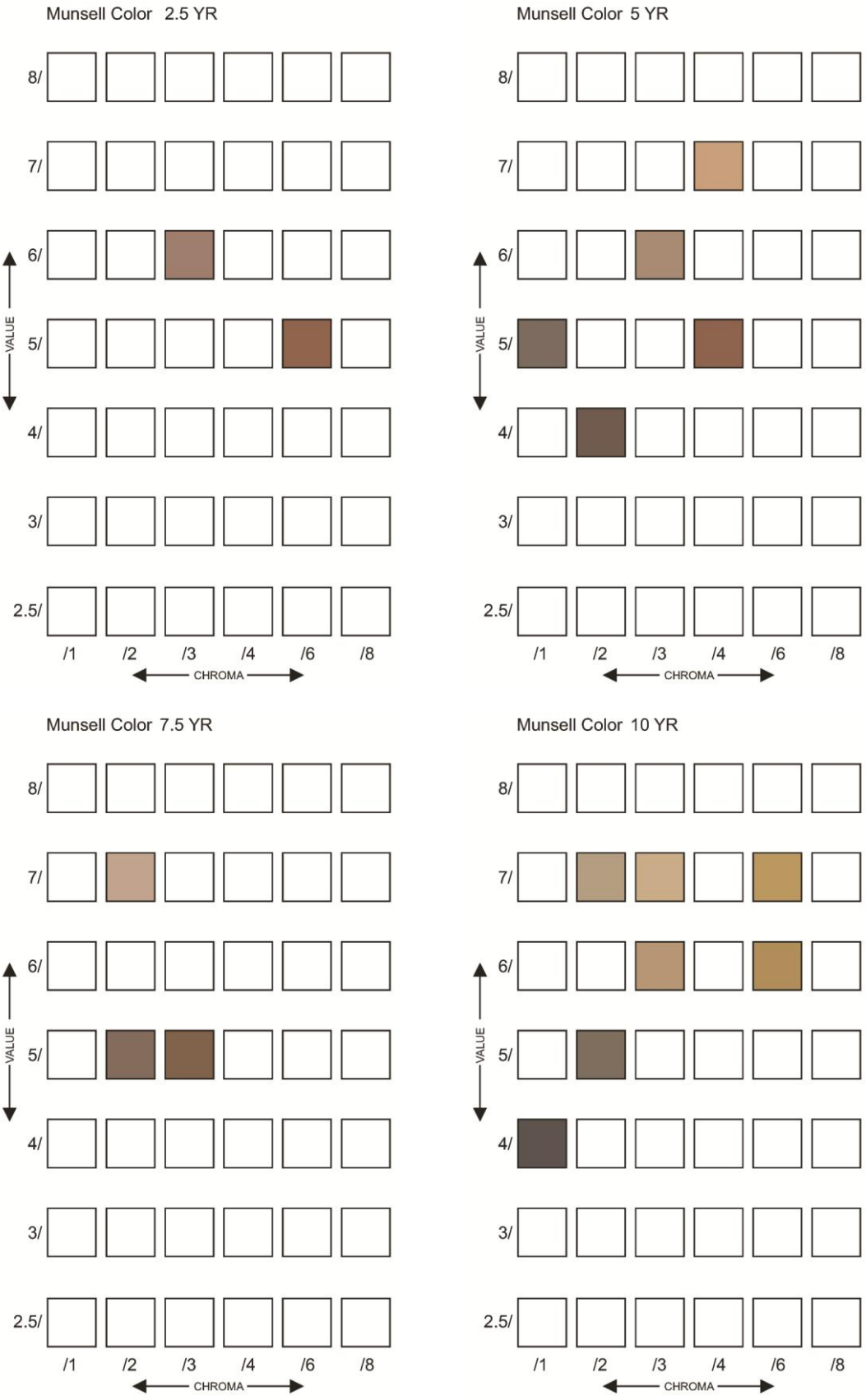

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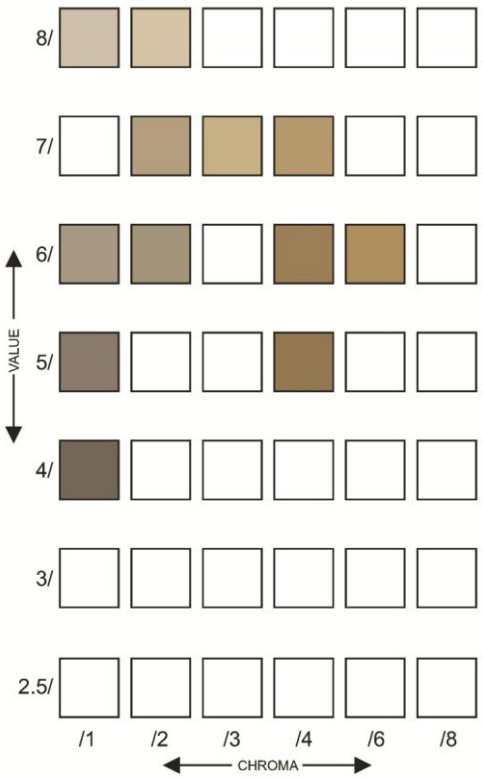

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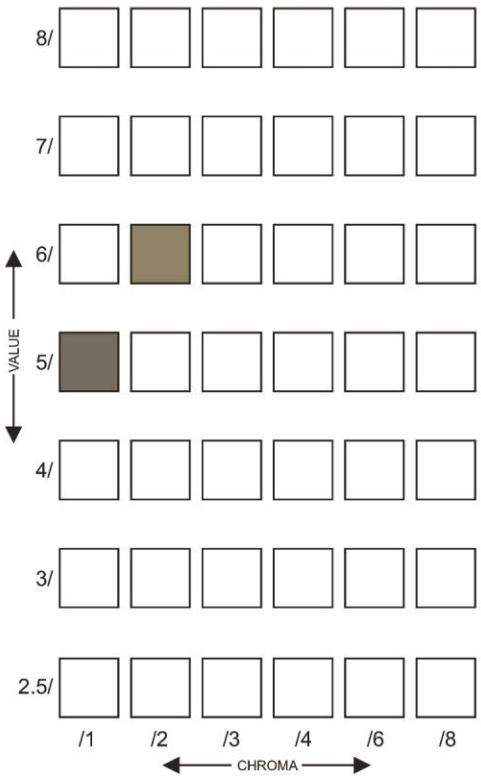

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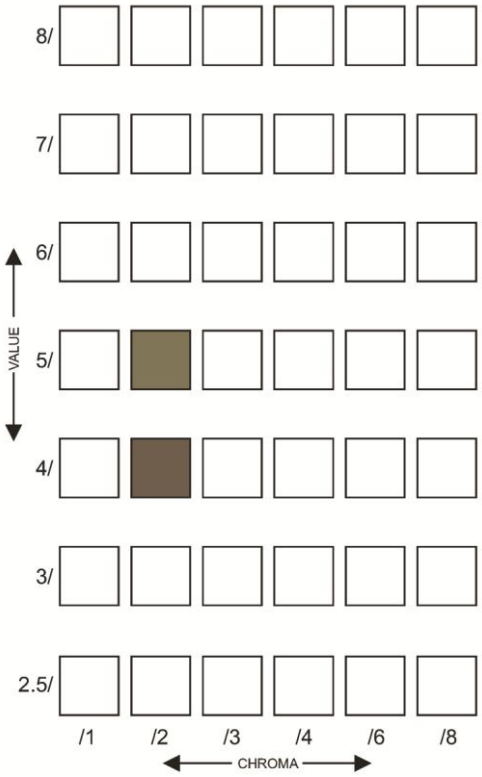

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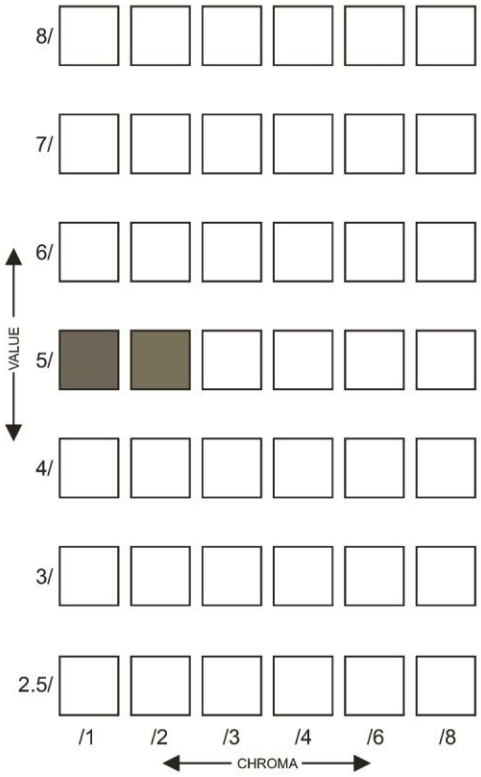

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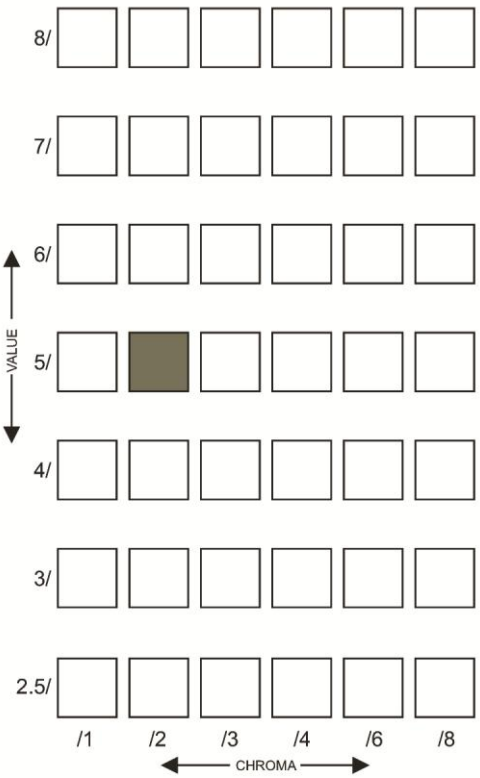

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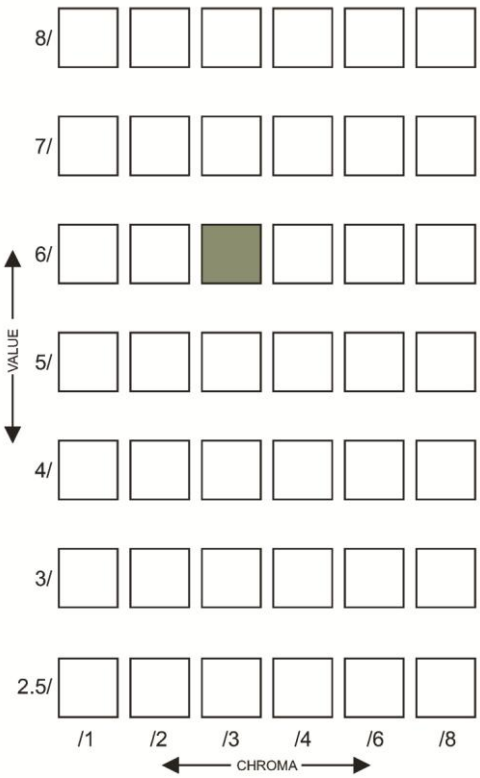

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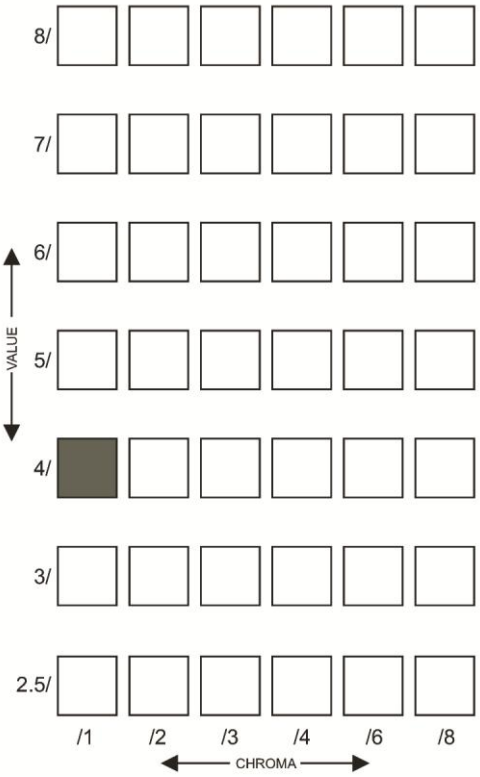

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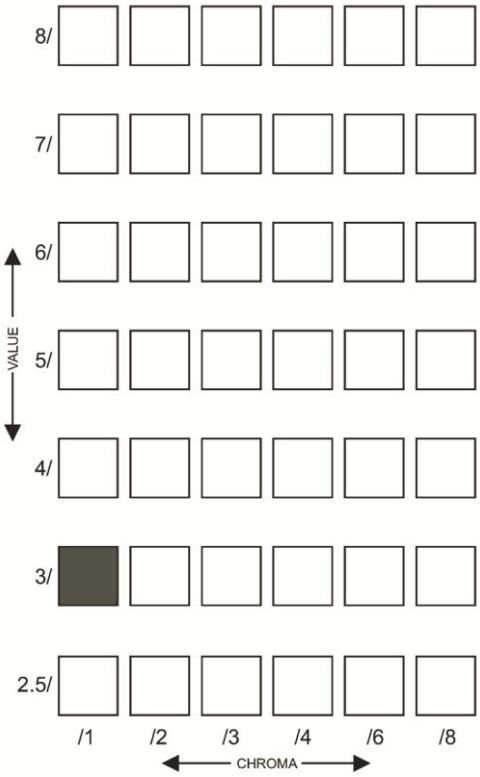

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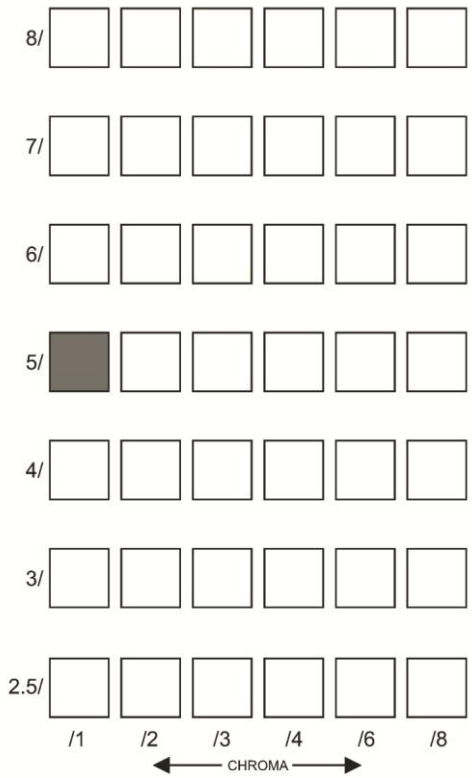

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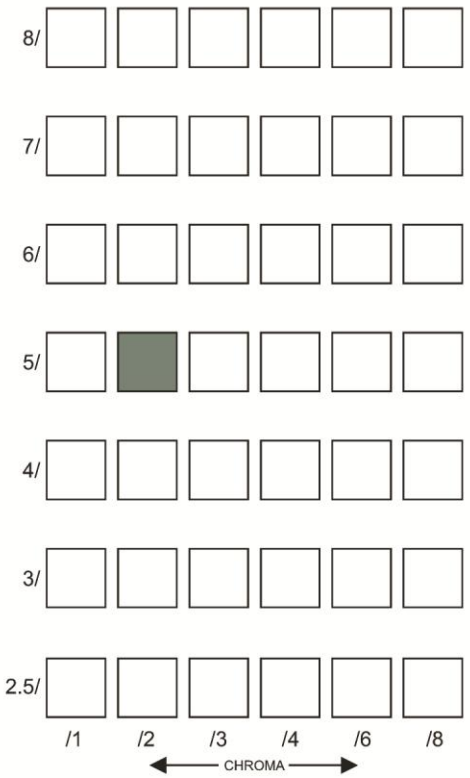

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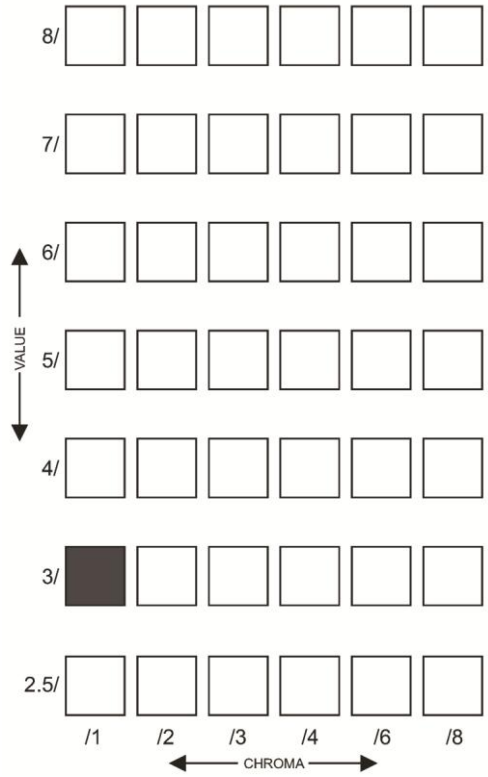

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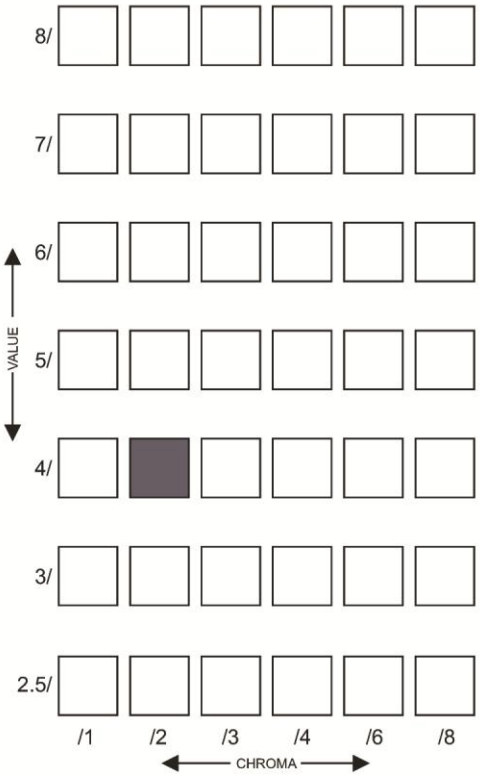
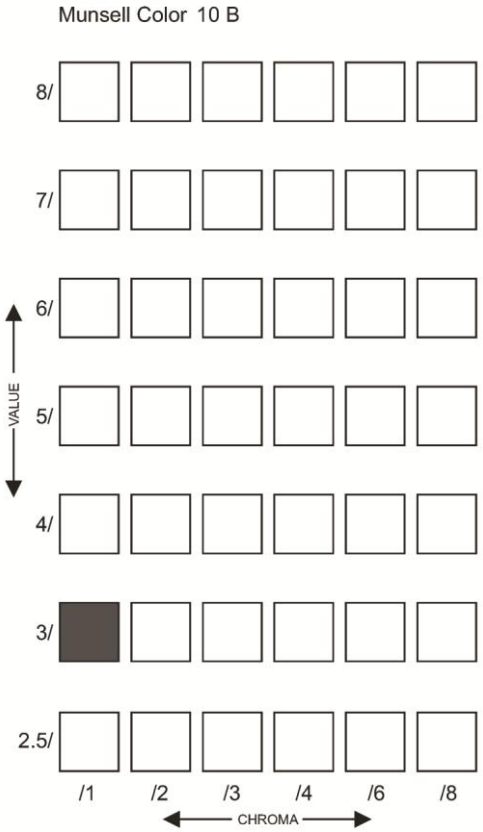


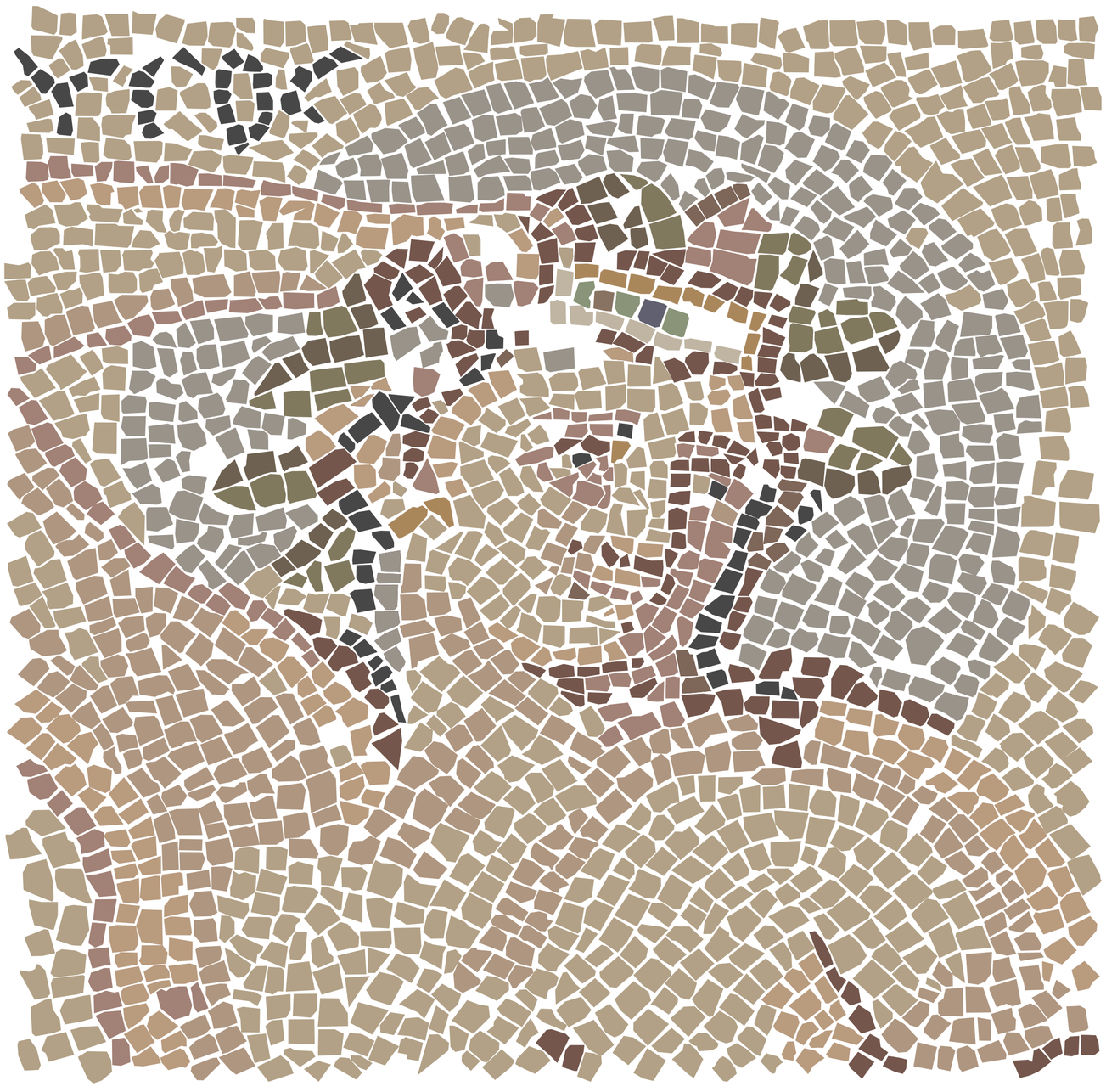

Munsell Color 10 B
8/
7/
6/
5/
4/
3/
2.5/
VALUE
/1
/2
/3
/4
/6
/8
CHROMA

APPENDIX B

DRAWINGS OF MOSAICS

Dionysus/Telete/Skyrtos Mosaic Drawing

Dionysus Medallion Drawing



0 1 2 3 4 5 6 7 8 9 10 cm

0 1 2 3 4 5 6 7 8 9 10 cm

CURRICULUM VITAE

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EDUCATION

Degree	Institution	Year of Graduation
MS	Bilkent University IAED	2009
BS	Bilkent University IAED	2006
High School	Adıyaman Anadolu High School	2001

WORK EXPERIENCE

Year	Place	Enrollment
2009- Present	Adıyaman University	Academician
2007-2009	Bilkent University IAED	Asistant
2006-2007	Dsgn-on	Interior Architect

FOREIGN LANGUAGES

Advanced English

PUBLICATIONS

International

Tanrıverdi, Y. (2016). Reading The Architecture; The Relationship Between The Architecture Of Roman Dwellings And The Identity, Social Meaning And The Status Of People In The Case Of Zeugma/Belkis, Turkey. *International Symposium on Culture and Identity in the Perspective of 21st Century*. 26-28 May 2014, Bakü

National

Tanrıverdi, Y. (2016). Adıyaman'ın Çevresel Tarihi ve Mimari Dokusu, Korunması ve Tanıtılması. *Adıyaman University Science, Culture and Art Symposium-II. 02-03 April 2015*, Adıyaman

Tanrıverdi, Y. (2016). Cam Sanatında Füzyon Tekniği Uygulamaları: Adıyaman Üniversitesi El Sanatları Cam Atölyesi Çalışmaları. Poster Sessions. *Adıyaman University Science, Culture and Art Symposium-II. 02-03 April 2015*, Adıyaman

HOBBIES

Reading, Glass and Ceramic arts, Movies, Travelling, Trekking