JMR

BURSA ULUDAĞ UNIVERSITY JOURNAL OF MOSAIC RESEARCH

AIEMA - TÜRKİYE

OFFPRINT / AYRIBASIM

VOLUME 11 2018

Bursa Uludağ University Press
Bursa Uludağ University Mosaic Research Center
Series - 3

Bursa Uludağ Üniversitesi Yayınları
Bursa Uludağ Üniversitesi Mozaik Araştırmaları Merkezi
Serisi - 3

JMR - 11

JMR

Volume 11

2018

AIEMA - Türkiye is a research center that aims to study, introduce and constitude a data bank of the mosaics from the ancient times to the Byzantine period. The best presentation of the mosaics of Turkey is the ultimate goal of this center functioning depending on AIEMA. A data bank of Turkey mosaics and a corpus including Turkey mosaics are some of the practices of the center. Additionally, this center also equips a periodical including the art of ancient mosaics and original studies namely JMR.

The JMR (Journal of Mosaic Research) is an international journal on mosaics, annually published by the Bursa Uludağ University Mosaic Research Centre. The aim of this journal is to serve as a forum for scientific studies with critical analysis, interpretation and synthesis of mosaics and related subjects. The main matter of the journal covers mosaics of Turkey and other mosaics related to Turkey mosaics. Besides, the journal also accommodates creative and original mosaic researches in general. Furthermore, together with articles about mosaics, the journal also includes book presentations and news about mosaics.

JMR is a refereed journal. The manuscripts can be written in English, German, French or Turkish. All authors are responsible for the content of their articles.

JMR is indexed as a full text by EBSCO since 2009; by TÜBİTAK - ULAKBİM Social Sciences Databases since 2014 and by Clarivate Analytics (Thomson Reuters) - Emerging Sources Citation Index (ESCI) since 2016. Articles are published with DOI number taken by Crossref.

JMR is published each year in November.

The abbreviations in this journal are based on German Archaeological Institute publication criterions, Bulletin de l'Association international pour l'Etude de la Mosaique antique, AIEMA - AOROC 24.2016, La Mosaique Gréco-Romaine IX and Der Kleine Pauly.

Journal of Mosaic Research
ISSN 1309-047X
E-ISSN 2619-9165

Nato Cad. No: 14 Kat: 1
12.matbaa
34418 Seyrantepe / Kağıthane-İstanbul
Tel: +90 (212) 281 25 80; www.onikincimatbaa.com
Certificate No: 33094

AIEMA - Türkiye, Antik Çağ'dan Bizans dönemine kadar uzanan zaman süreci içerisindeki mozaikler hakkında bilimsel çalışmalar yapmayı, bu mozaikleri tanıtmayı ve söz konusu mozaikler hakkında bir mozaik veri bankası oluşturmayı amaçlayan bir araştırma merkezidir. AIEMA'ya bağlı olarak, Türkiye mozaiklerinin en iyi şekilde sunumu, bu merkezin işleyişinin nihai hedefidir. Türkiye mozaik veri bankası ve Türkiye mozaiklerini de içeren bir Corpus hazırlanması çalışmaları, merkezin faaliyetlerinden bazılarıdır. Ayrıca, merkezin, antik mozaikler hakkında özgün çalışmaları içeren JMR (Journal of Mosaic Research) adında bir süreli yayını vardır.

JMR (Journal of Mosaic Research) Dergisi, her yıl Bursa Uludağ Üniversitesi Mozaik Araştırmaları Merkezi tarafından, mozaikler konusunda yayınlanan uluslararası bir dergidir. Bu derginin amacı, mozaikler hakkında eleştirel bir analiz, yorumlama, mozaik ve onunla ilgili konuların sentezi ile bilimsel çalışmalar için bir platform oluşturmaktır. Derginin temel konusu, Türkiye mozaikleri ve Türkiye mozaikleriyle ilişkili mozaiklerdir. Bunun yanında, dergi yaratıcı ve özgün mozaik araştırmaları içeren diğer mozaiklerle ilgili makaleleri de kabul etmektedir. Ayrıca dergide, mozaikler hakkındaki makalelerle birlikte, kitap tanıtımları ve haberler de bulunmaktadır.

JMR hakemli bir dergidir. Makaleler İngilizce, Almanca, Fransızca ve Türkçe dillerinde yazılabilir. Dergide yayınlanan makalelerin sorumluluğu makale sahiplerine aittir.

JMR, 2009 yılından itibaren EBSCO tarafından tam metin olarak, 2014 yılından itibaren TÜBİTAK - ULAKBİM Sosyal Bilimler veri tabanları tarafından ve 2016 yılından itibaren ise Clarivate Analytics (Thomson Reuters) - Emerging Sources Citation Index (ESCI) tarafından taranmaktadır. Makaleler, Crossref'ten alınan DOI numarası ile yayınlanmaktadır.

JMR, her yıl Kasım ayında yayınlanmaktadır.

Bu dergideki makalelerde kullanılacak olan kısaltmalar Alman Arkeoloji Enstitüsü yayın kuralları, Bulletin de l'Association international pour l'Etude de la Mosaique antique, AIEMA - AOROC 24.2016, La Mosaique Greco Romaine IX ve Der Kleine Pauly dikkate alınarak yapılmalıdır.

For detailed information please visit website / Detaylı bilgi için lütfen web sitesini ziyaret ediniz:

http://arkeoloji.uludag.edu.tr/JMRe/

Address / Adres:
Bursa Uludağ University / Bursa Uludağ Üniversitesi
Faculty of Art and Sciences / Fen Edebiyat Fakültesi
Department of Archaeology / Arkeoloji Bölümü
16059 - Görükle / BURSA – TÜRKİYE

Tel & Fax: + 90 224 2941892
E.mail : mosaicsjournal@gmail.com
aiematurkey@uludag.edu.tr
Facebook: @journalofmosaicresearch
Instagram: @journalofmosaicresearch
Twitter: @mosaicsresearch

José María Blázquez Martínez in memoriam (1926-2016)

José María Blázquez Martínez (Professor of Ancient History and Fellow of the Spanish Royal Academy of History) passed away on March 26, 2016, in the city of Madrid (Spain) after a full life devoted to teaching, scientific research and the spread of antiquity; and leaving all of us -who have had the immense fortune to enjoy his mastership and overwhelming personality-, with an immense sadness.

Prof. Blázquez graduated in Philosophy and Letters from the University of Salamanca in 1951 and defended his PhD in the Complutense University of Madrid in 1956. During the next decade, Prof. Blázquez continued his training under the supervision of Prof. Pallottino at the University of La Sapienza in Rome and, granted by the DAAD, at the University of Marburg, under the supervision of Prof. Matz and Prof. Drerup. Subsequently he made other successful research stays at the University of Tel Aviv, the British Academy of Rome, the University of Catania, and in the German Archaeological Institute branches at Istanbul, Damascus and Riyadh. In this regard, Prof. Blázquez always defended the importance of international networks that, through academic contact with other schools and colleagues, conceived as essential for personal development and the progress of scientific research.

After this intense formative period, José María Blázquez obtained a position as Professor of Ancient History at the University of Salamanca (1966-) and shortly after at the Complutense de Madrid (1969-), where he was designated as Professor Emeritus. At the same time, he was an active member of the former Institute of Archaeology "Rodrigo Caro" (CSIC), that he directed during more than ten years (1973-1985). Finally, in recognition to his academic trajectory, Professor Blázquez was elected as a Fellow of the Spanish Royal Academy of History. In all these institutions Prof. Blázquez developed a brilliant contribution to the promotion of Ancient History in Spain, especially important was his capacity for mentoring (he supervised more than 40 PhDs during his academic life) large teams of teachers and researchers, that obtained several tenured positions in different universities and academic institutions. He was also a prolific author publishing many handbooks and monographs that are authentic milestones in history the Spanish scholarship (i. e. *La Romanización, Historia social y económica. La España Romana. Economía de la Hispania romana*, Bilbao, 1978, *Historia de España Antigua, I. Protohistoria*, Madrid, 1980; *Historia de España Antigua II. Hispania romana*, Madrid, 1978). Largely influential was also his leadership in the direction of the scientific journals as *Archivo Español de Arqueología* (1973-1987) and *Gerión* (1983-2010). In addition, Prof. Blázquez directed numerous archaeological excavations at Caparra (Cáceres), Cástulo (Jaén), La Loba (Fuenteovejuna, Córdoba), and in the Monte Testaccio (Rome).

By virtue of its training and its wide perspective, Prof. Blázquez's research trajectory was the reflection of the scientist dedicated to the study of antiquity, with a masterful management of

diverse written and archaeological sources, always connected with current intellectual debates of all social and human sciences. During his career published more than 37 books, acting of editor in other 9 monographs. He also published 234 articles in the most prestigious, both Spanish and International, scientific journals and several chapters in collective volumes. His research interests covered multiples areas on the study of antiquity: the Phoenician and Greek colonization of the Western Mediterranean, the Late Iron Age communities of the Iberian Peninsula, the study of Pre-Roman religions, the Impact of primitive Christianism in the Late Roman Empire, and, of course, the ancient economy of Roman Spain, with an special focus on the exports of *Baetican* olive oil.

Finally, we would like to highlight his research on Roman mosaics, whose first publication dates from 1975 - "Arte y Sociedad en los mosaicos del Bajo Imperio" [Art and Society in the mosaics of the Late Roman Empire] *Bellas Artes* 75, 1975, pp. 18-25 -soon followed by- "Mosaicos romanos del Bajo Imperio" [Roman mosaics of the Late Empire], *Archivo Español de Arqueología* 50-51, 1977, pp. 269-293., In this regard, Prof. Blázquez continued the a research line previously initiated by his teacher Prof. Antonio García y Bellido. Since 1976 to 1996, Prof. Blázquez promoted and directed the Corpus of Mosaics of Spain, within the framework of the international project sponsored by the AIEMA. Through this monumental labor, Prof. Blázquez contributed to establish the study of Roman mosaics as an authentic sub-discipline in the field of the Spanish Classical archaeology.

The obtention of several I+D Research projects, funded in competitive calls by the Spanish Ministry of Science (acting as Principal Investigator from 1976 to 1997) and an International Project of the Joint Hispanic-American Committee, with the University of West-Lafayette, Purdue (Indiana-USA), allowed Prof. Blázquez to create a permanent research team on the study of Roman mosaics. This team, which I (Prof. Neira Jiménez) am honored of have been part, managed the realization of the above mentioned *Corpus de Mosaicos de España* (CME), a work continued afterwards by its dear colleague, Dr. Guadalupe López Monteagudo (CSIC). In addition to the publication of 12 volumes of the CME, he presented numerous papers on the Hispanic, African and Near Eastern Roman mosaics in the most prestigious conferences on these topics, such as the International Congresses organized by the AIEMA or *L'Africa romana* confe-rence, organized by the Centro di Studi sull'Africa Romana of the Università degli studi di Sassari, as well as in countless courses and seminars in other ins-titutions and universities, such as the Roman Mosaic Seminar of the UC3M, to which he attended every year, without missing any of the 9 editions celebrated.

Prof. Blázquez was a firm believer in the work developed by AIEMA, having been named member of Honor of this scientific association. He also formed part of the editorial board of the Journal of Mosaic Research, where he published various articles, and presented papers in both the 11th International Colloquium on Ancient Mosaics, held in Bursa on 2009, and in the 5th Colloquium of AIEMA Turkey , held in Kahramanmaraş on 2011. Prof. Blázquez was a true lover of Turkey.

Prof. Blázquez was an unavoidable reference in the international scholarship on ancient mosaics, many colleagues who share our pain remember his vitality even in the XIII. AIEMA Congress held in Madrid on September 2015, where he gave the inaugural conference. As a testimony of his enthusiasm for the study of ancient mosaics, he was already thinking of traveling to the next AIEMA Congress scheduled for 2018 in Cyprus. Proof of his infinite generosity, he prepared

tirelessly until the end of his days a text on Diana in the mosaics of Roman Spain for X SMR, held in September 2016 at Universidad Carlos III de Madrid.

His decisive contribution to the study of antiquity has earned him numerous recognitions from many international academic institutions and associations: Fellow of German Archaeological Institute (1968), Board member of the L'Association Internationale d'Epigraphie grecque et latine (AIEGL), Member of the Hispanic Society (1974); Fellow of the Academy of Arts and Archaeology of Bolonia (1980), Fellow of the Spanish Royal Academy of History (1990), Fellow of the New York Academy of Sciences (1993), Fellow of the Academia Nazionale dei Lincei (1994), Fellow of the Fine Arts Academy of Santa Isabel de Hungría (Seville) (1995), Fellow of the Real Academia de Bones Letres de Barcelona (1997), or Fellow of the Académie de Aix-en-Provence (1999), among others. He also received many prizes as the Franz Cumont prize from the Académie Royale de Belgique (1985), the Great Silver medal of Archaeology from l'Académie d'Architecture de Paris (1987), or the Cavalli d'Oro prize from Venice (2003). Prof. Blázquez was named *doctor honoris causa* by the universities of Valladolid (1999), Salamanca (2000), Bolonia (2001), León (2005), and Universidad Carlos III de Madrid (2015), and received the *Orden del Mérito Civil*, one of the highest recognitions granted by the Spanish govern.

He was a genius as scholar, but also a genial person. For both reasons, colleagues, students, and friends of many countries, that have the fortune of meet Prof. Blázquez during his life, feel a great emptiness for the loss of our dear teacher.

Prof. Dr. Mustafa Şahin
Bursa Uludağ University

Prof. Maria Luz Neira Jiménez
Universidad Carlos III de Madrid

CONTENTS

JOURNAL OF MOSAIC RESEARCH

DOI: 10.26658/jmr.440590 JMR 11, 2018 173-178

New Documentation Technologies: The "Mosaico de Otoño" of the "Casa del Anfiteatro", Mérida, Spain

Yeni Belgeleme Teknolojileri: "Amfitiyatro Evi'nden Sonbahar Mozaiği", Mérida, İspanya

Mª Paz PÉREZ CHIVITE*

(Received 02 November 2017, accepted after revision 05 July 2018)

Abstract

The graphic documentation of a mosaic preserved in situ is a laborious job. Nowadays, with the advance of new technologies, it is feasible to elaborate a detailed and accurate documentation. To do this, two technologies must be combined: Orthophotography and a Geographic Information System (GIS). The application of these new tools allows qualitative and quantitative studies based on the knowledge of the geographical space. You can make measurements and identify each tessera in its exact location, with geographic coordinates, and, in addition, you can see all the details of the mosaic and the entire room, with a single digital file.

With this objective, we have designed and put into practice this new documentation methodology. We have applied this method in the Archaeological Site of Mérida, in Spain. In particular, we have studied one of the most emblematic mosaics of Augusta Emerita: the "mosaico de Otoño". This pavement is located in the famous "Casa del Anfiteatro", which stands out for the quality and quantity of its Roman mosaics. The management and conservation of the archaeological site is carried out by the Consorcio of the Monumental Ciudad of Mérida, institution from which we have carried out this investigation.

With this work we have obtained the first study on the reintegration of tesserae, getting a map with the old interventions (from Roman times) and modern ones that had not been documented since the discovery in the 60s. Also, from the drawings on the orthophotography, we also get the first results for the analysis of the iconography, identifying the figures and the geometric motifs in their whole. This digital analysis is, in addition, a fundamental document to certify the current state of conservation and keep track of deterioration over time.

Keywords: *Conservation in situ, orthophotography, Geographic Information System (GIS), documentation, Emerita Augusta.*

Öz

Yerinde korunan mozaiklerin grafik belgelemesi oldukça zahmetli bir iştir. Günümüzde, yeni teknolojilerin gelişmesine paralel olarak, ayrıntılı ve doğru bir belgelemenin detaylandırılması mümkündür. Detaylı bir belgeleme yapabilmek için ortofotografi ve Coğrafi Bilgi Sistemleri (CBS) teknolojilerinin birlikte kullanılması gerekmektedir. Bu yeni araçların uygulanması, coğrafi alan bilgisine dayalı nitel ve nicel çalışmaların yapılmasına imkan sağlamaktadır. Böylelikle, tek bir dijital dosya üzerinden her bir tesseranın ölçüleri alınabilmekte ve tanımları yapılabilmekte, coğrafi koordinatlar yardımıyla da mozaiğin ve tüm mekânın detayları görülebilmektedir.

Bu amaçla, bu yeni doküman tasyon metodolojisi tasarlanmış ve uygulamaya geçirilmiştir. Bu yöntem İspanya'daki Mérida Arkeolojik Sit Alanı'nda uygulanmıştır. Özellikle de, Augusta Emerita'nın en sembolik mozaiklerinden birisi olan "Sonbahar Mozaiği" (Mosaico de Otoño) üzerinde çalışılmıştır. Bu mozaik döşeme, içinde barındırdığı Roma mozaiklerinin hem nitelik hem de nicellik açısından öne çıkan bir niteliğe sahip olan ünlü "Amfitiyatro Evi'nde" (Casa del Anfiteatro) yer almaktadır.

* Mª Paz Pérez Chivite, Consorcio Ciudad Monumental de Mérida. c/Santa Julia, nº 5. 06800 Mérida, Spain. ORCID ID: https://orcid.org/0000-0001-5149-7828. E-mail: marypaz@consorciomerida.org

Arkeolojik alanın yönetimi ve korunması, bu araştırmayı yürüttüğümüz alandan sorumlu olan Mérida Anıtsal Kent Konsorsiyumu tarafından yürütülmektedir.

Bu yöntem sayesinde tesseraların yeniden entegrasyonu ile ilgili ilk çalışma yapılmış, aynı zamanda Roma Dönemi'nden itibaren yapılan eski müdahaleler ve 1960'lardaki keşfinden günümüze kadar yapılmış müdahaleler hakkında bir harita elde edilmiştir. Ayrıca, ortofotografi çizimleri sayesinde ikonografi analizi yapılabilmiş, figürlerin ve geometrik motiflerin bir bütün olarak tanımlanması ile ilgili ilk sonuçlar elde edilmiştir. Bütün bunlara ek olarak, böyle bir dijital analizin yapılması mevcut koruma durumunun belgelenmesi ve zaman içindeki bozulmanın takip edilmesi için temel bir belge elde edilmektedir.

Anahtar Kelimeler: *İn situ koruma, ortofotografi, Coğrafi Bilgi Sistemi (CBS), dokümantasyon, Emerita Augusta.*

Introduction

The *in situ* conservation of mosaics is a complex task and carries a great responsibility for institutions and professionals. The mosaics are part of our archaeological heritage, and therefore we know that we have to guarantee its accessibility in the present and its permanence in time for future generations.

Thanks to international organizations as important as the ICCM or the AIEMA, much progress has been made in the knowledge and safeguarding of mosaics. Criteria and methodologies for conservation and restoration have been established, *corpus* has been made, and research has been carried out on materials, execution technique, history and iconography, spreading knowledge through congresses, workshops, publications, social networks and other institutions.

Graphic documentation is one of the issues that have been addressed, due to its complexity and importance. Specific manuals have already been published on the methodology that must be carried out (Alberti et al. 2013: 11-20). It is done by careful photomontage of digital images. The photo camera and Adobe Photoshop software are the necessary tools to create a complete image of the entire surface. However, the results depend to a large extent on the skill and time of the professional.

In this article, we present a new methodology that improves the accuracy of this type of documentation. The same photomontage principles are followed, but applying the science of photogrammetry and topography. That is, the mosaic is treated as a spatial object, with its cartographic coordinates and is located on a map of the city. For this it is necessary to apply a Geographical Information System.

We have applied this project on one of the best and best-known Roman mosaics in Mérida: the "mosaico de Otoño" of the "Casa del Anfiteatro". The Consorcio of the Ciudad Monumental of Mérida is the institution that protects the entire site of the city and from where we have done this work.

Description of the Mosaic

The mosaic of Autumn is one of the main pavements that decorate the Roman House of the Amphitheatre of Merida. It was discovered in 1963 (García 1966: 23-25, 33),during this decade the *domus* was excavated, and since then the mosaics have been preserved *in situ*.

It is a work that is known for its iconographic motifs (Blanco 1978: 44). It consists of two juxtaposed central carpets, each one with representation of human figures. In the first carpet (or higher) appear the personifications of Venus and Cupid child, and in the second (or lower), the scene of winemaking is represented by three men who tread the grapes. Vegetable scrolls appear, figures of animals

such as lions and birds, craters and children collecting the grape from the vines. The perimeter carpet is geometric combining different squares in white, red and black. The mosaic stands out for its technical quality and the variety of colours. In addition to the stone, the vitreous paste is used for certain details such as the feathers of the birds or the mantle of Venus, and it also consists of a reintegration with gold *tesserae*, reserved for the jewels worn by Venus: a bracelet and a diadem. It occupies a room commonly interpreted as *triclinium* with a total area of 45 m^2.

After the works of archaeology during the 60s, the conservation ones followed one another. At this time, *in situ* conservation was already contemplated and it was also intended to include this magnificent *domus* within the archaeological site of the city. To date, it is still the house with the largest area of mosaics, which also stands out for its historical and artistic quality.

The conservation works in this period consisted in removing the mosaics from their original stratigraphy and transferring them to a new support of reinforced concrete. Thus, the fastening of the *tesserae* to a new material of great hardness was ensured, at the same time that it allowed the power to step on them as if it were a new floor.

Since then, different works have been carried out for its maintenance. The last restoration was carried out in 2005. As of this date, the need to improve the registration system for the documentation of this type of pavement was verified and a new methodology on this same mosaic was investigated. In 2009, the first orthophoto of this mosaic was obtained (Pérez 2016: 21-22).

Today, you cannot visit because the house is closed. Since 2011, the construction of a roof has been carried out and the integral adaptation project is currently being developed, from the Consorcio de la Ciudad Monumental de Mérida. To reopen the site in optimal conditions for the visit of the public and ensure the conservation of this magnificent *domus*.

Description of the New Methodology for Documentation

The proposed methodology involves an interdisciplinary work, at least a team that includes the works of: a restorer (manipulation and care of the mosaic), a photographer (taking photographs), a topographer (taking geographic coordinates) and a computer drawer (drawing and processing of digital images). With this equipment you can get the orthophotography of the mosaic, that is, the zenith image of the pavement and that serves as a study document.

Once this orthophotography or zenithal image of the mosaic has been obtained, it is possible to work through a Geographic Information System (GIS). At the present, this registration system is used for the documentation of territory areas and is also applied in archaeology (Pizzo 2005: 592-593; Ortiz – del Pino 2013: 90-93). This documentation procedure allows the photographic assembly of the whole, from a grid of continuous photos as a single image. The inclusion of coordinates allows to work at the desired scale and with the real measurements without distortion of the image.

From this generated image, which functions as a mosaic plane, multiple maps can be made. The possibility of study is open to any desired research path: history, iconography, materials, conservation interventions, deterioration, etc. From here, any scientist can contribute with their knowledge and enrich the results obtained.

The steps are the following:

- Planning mosaic data collection

  - Elaboration of a grid in situ, placing numbered stickers in the vertices of each square. The dimensions of each square may vary, it is recommended that they be homogeneous and not exceed one square meter.

  - Choice of time of day with optimal light, avoiding shadows.

  - Light superficial cleaning of accumulated deposits.

- Data collection

  - Setting up of the photo camera on the tripod or support to be used and parameter settings.

  - Capture of photos following the order of the grid, must be agile to avoid changes of light.

  - Geographical coordinates taking by total station or GPS.

- Processing of images and preparation of orthophotography

  - Download pictures on computer.

  - Correction of the distortion of each photograph using photogrammetry software (AsRIX) and inclusion of the measurements according to the grid (Figs. 1 - 2).

  - Assembly by drawing software (AutoCAD) of each rectified image to obtain the complete mosaic.

  - Export of the assembly as a single image and only file, PDF example.

- Preparation of maps using GIS

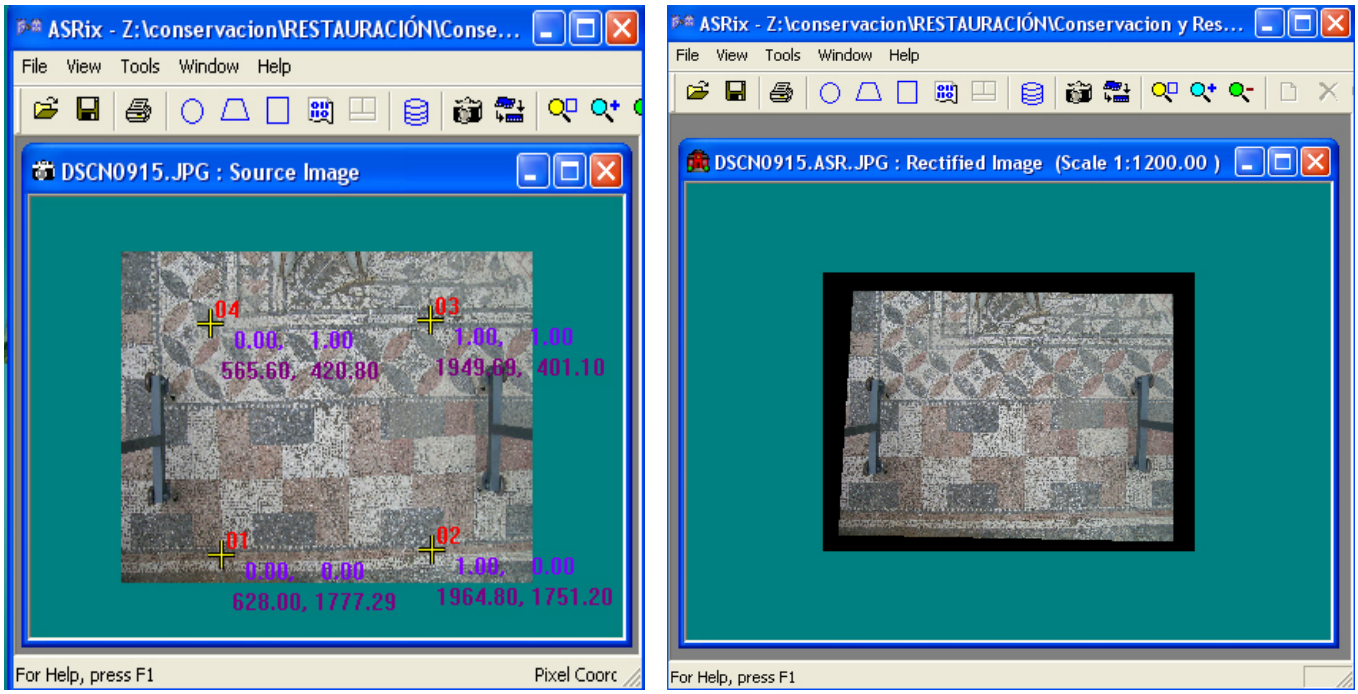
  - Dumping of data in geographic information software (ArcGIS):

    - Mosaic image

    - UTM coordinates of the mosaic

Figure 1
Example of the methodology of geographic coordinates. Mosaico de Otoño of the Casa del Anfiteatro. Image by M. Paz Pérez.

Figure 2
Example of the methodology processs: rectified photography after entering the geographical coordinates. Mosaico de Otoño of the Casa del Anfiteatro.
Image by M. Paz Pérez.



- Drafting for the analysis and identification of:
  - Motifs of iconography and
  - Roman and modern reintegration lacunae (Fig. 3)
- Design of data presentation through maps (Fig. 4).

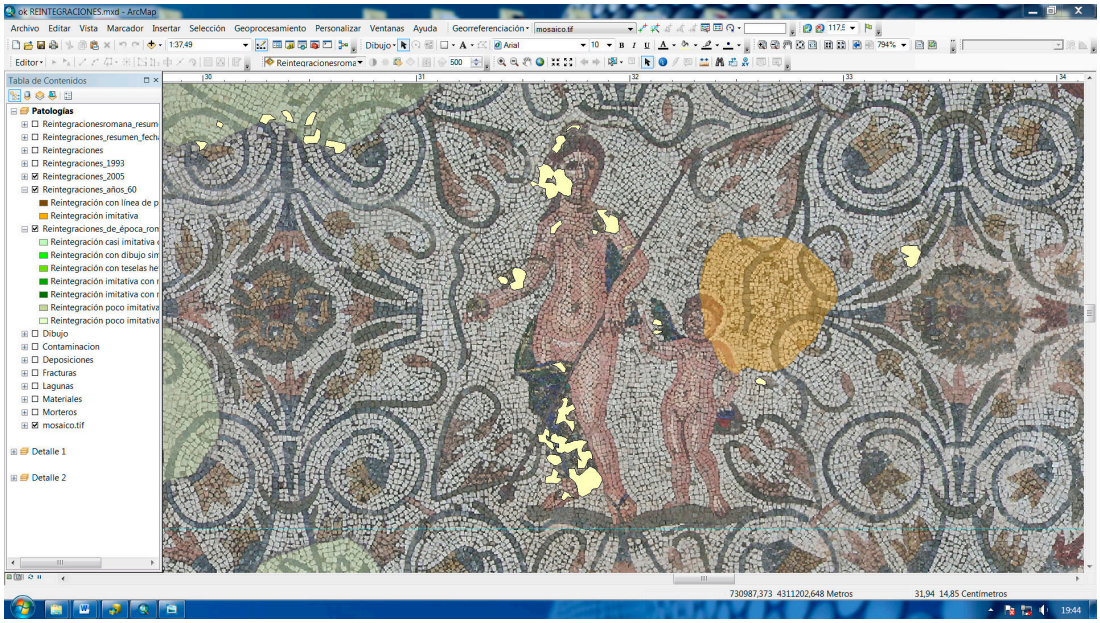
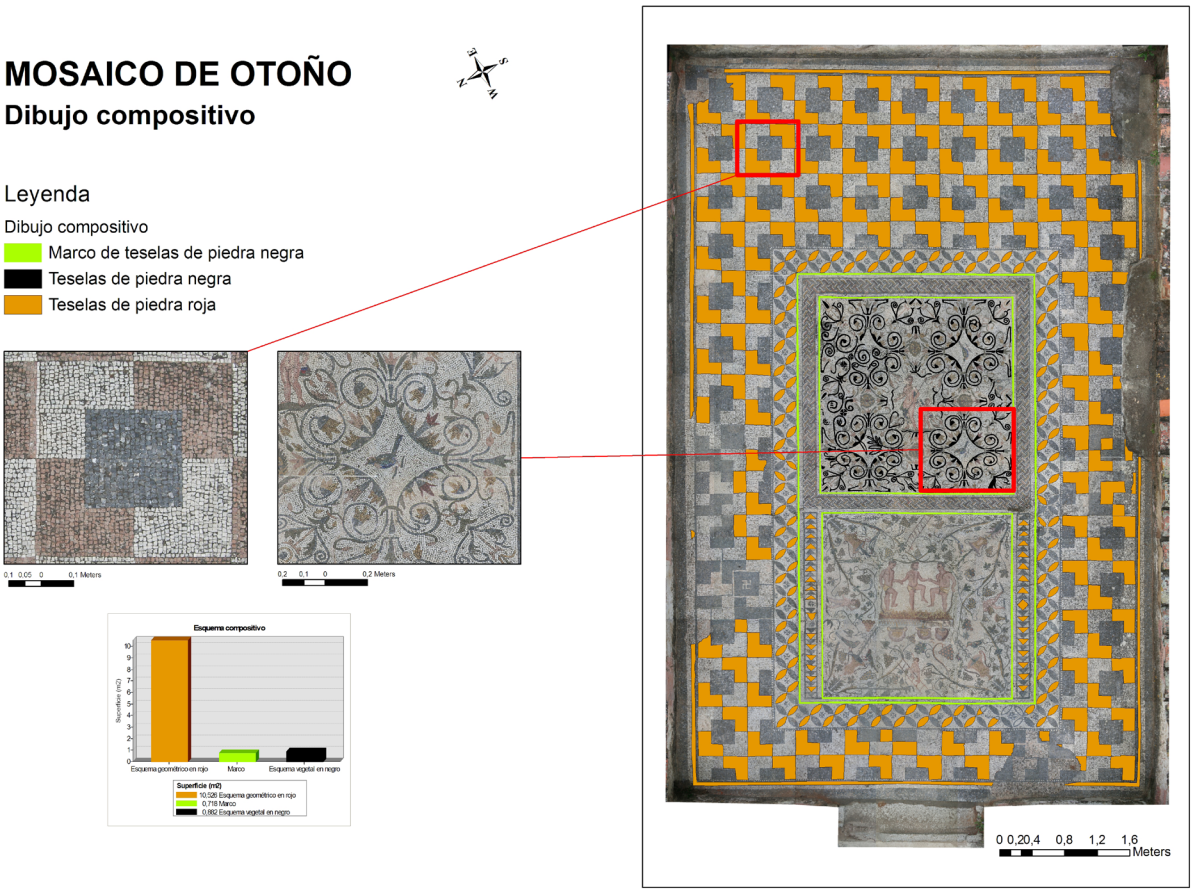


Figure 3
Detail of the reintegration drawing for the study on orthophotography. Mosaico de Otoño of the Casa del Anfiteatro. Map by M. Paz Pérez.

Figure 4
Example of finished map with study of drawing of the compositional scheme on orthophotography. Mosaico de Otoño of the Casa del Anfiteatro. Map by M. Paz Pérez.



Results and Conclusions

The result is a single image, with the zenith view of the entire mosaic. The margin of error is minimal due to the reduced size of the grid and the rectification by coordinates. The process, although it can be slow, allows to obtain a high quality and metric precision and colour. The orthophotography of this mosaic allows the observation of the entire pavement with a sufficient level of detail to identify the tiles. For example, we have been able to verify and draw in plan, that only three of the gold leaf *tesserae* of the Venus bracelet are conserved.

From here, and through work with a GIS, the possibilities are endless for multiple studies. In this case, studies of the iconographic scheme and of reintegration gaps have been carried out (Ardovino 2003: 17-26).

From the iconographic analysis by means of the drawing of the composition, the modifications and the irregularity of the geometry can be detected. It is very easy to identify the original layout of the *tesserae*.

In turn, the reintegration map allows detecting the additions and changes that could be made at the origin or during the course of the stay. And also contrast with the current existing documentation.

Therefore, we believe that digital orthophotography is a fundamental tool for the analysis of large surfaces. To obtain this document it is necessary to resort to photogrammetry techniques and have an interdisciplinary team. Spatial calculations are achieved working through a geographic information system (GIS), this entails great precision and objectivity when it comes to issuing results.

So, after presenting these results, we demonstrate that it is feasible to carry out this type of work and that it greatly improves the knowledge of the mosaics. At the same time, the possibility of future and multiple investigations for professionals is broadened.

Bibliography - Kaynaklar

Alberti et al. 2013 — A. Livia – E. Bourguignon – E. Carbonara – T. Roby – J. S. Escobar, Illustrated Glossary: Technician Training for the Maintenance of in Situ Mosaics, Getty Conservation Institute, Tunis, Institut National du Patrimoine de Tunisie.

Ardovino 2003 — A. M. Ardovino, “Problemi di filologia del restauro e delle techniche antiche sul mosaico”, Atti dell’Incontro di Studio Tematico, 15 aprile 2002, AISCOM, Bologna, 17-26.

Blanco 1978 — A. Blanco Freijeiro, Corpus España I, Madrid.

García 1966 — E. García, Informe sobre las casas romanas de Mérida y excavaciones en la “Casa del Anfiteatro”, EAE 49, 23-25, 33.

Ortiz – del Pino 2013 — P. Ortiz – B. del Pino, “Digitalización 3D automática con láser escáner, fotogrametría y videogrametría. El caso práctico del Templo de Diana (Mérida)”, Revista VAR 4, nº 8, 90-94.

Pérez 2016 — M. P. Pérez, Conservación in situ de los mosaicos romanos de Mérida. Historia y tecnologías de la información geográfica aplicadas, Doctoral thesis. Universidad del País Vasco, Spain.

Pizzo 2005 — A. Pizzo, “Técnicas de documentación gráfica para el estudio de la edilicia histórica. La rectificación fotográfica como instrumento para el análisis arqueológico”, Memoria 8, Mérida Excavaciones Arqueológicas 2002, Mérida, 587-593.