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A Unique Silver-Stained Glass Vessel from Eighth- to Ninth-Century Šaqunda (Cordoba)

The glass finds recovered from the excavations of the old suburb of Šaqunda in Cordoba are precisely dated from the mid-eighth century to 818 C.E.¹ From their compositional analysis, we can glean significant insights into the transformational period in glassmaking following the Islamic conquest of the Mediterranean.² The data revealed extensive recycling of natron-type glass and the importation of a few finished objects, including Islamic natron glasses from Egypt (Egypt 1 and 2) and Mesopotamian plant-ash glasses. The shortages of fresh glass supplies appear to have led to

the development of a local lead glass production, using lead slag from nearby silver or lead mines.³

Among the finds from Šaqunda is a stained glass (luster) fragment (MIR 051) exhibiting compositional features similar to those of the compositional group Egypt 2, dated from the last quarter of the eighth century to the second half of the ninth century C.E.⁴ It has an exceptionally low alumina concentration ($\text{Al}_2\text{O}_3 < 1.5\%$), a relatively low strontium to lime ratio, and elevated titanium and zirconium contents (Table 1). The decoration consists of silver staining that was applied to the

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1. For an updated overview of the research conducted on Šaqunda, see María Teresa Casal García, "The Rabad of Šaqunda in Umayyad Córdoba (750–818 AD)," in *Entre civitas y madina: El mundo de las ciudades en la Península Ibérica y en el norte*

de África (siglos IV–IX), ed. Sabine Panzram and Laurent Callégarin, Collection de la Casa de Velázquez, v. 167, Madrid: Casa de Velázquez, 2018, pp. 119–132.

2. Nadine Schibille and others, "Ex novo development of lead glassmaking in early Umayyad Spain," *Proceedings of the National Academy of Sciences of the United States of America*, June 22, 2020, <https://doi.org/10.1073/pnas.2003440117> (accessed July 3, 2020).

3. *Ibid.*

4. Nadine Schibille and others, "Chronology of Early Islamic Glass Compositions from Egypt," *Journal of Archaeological Science*, v. 104, April 2019, pp. 10–18.

TABLE 1

Average LA-ICP-MS Data of the Stained Glass Fragment MIR 051
(Base Glass and Silver Stain)

	wt %											ppm				
	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	P ₂ O ₅	Cl	K ₂ O	CaO	TiO ₂	MnO	Fe ₂ O ₃	Cu	Zn	Sr	Zr	Ag
MIR 051 (n=9)	18.0	0.43	1.48	72.4	0.09	1.25	0.31	4.73	0.31	0.02	0.79	2.99	16.7	114	264	0.08
σ	0.1	0.01	0.07	0.2	0.00	0.02	0.00	0.10	0.00	0.00	0.01	0.06	0.4	2	36	0.01
staining (n=3)	1.99	0.53	1.83	86.0	0.12	1.26	0.21	6.59	0.36	0.02	0.96	13.9	22.0	139	332	93.3
σ	0.30	0.01	0.02	1.2	0.00	0.05	0.03	1.32	0.01	0.00	0.00	3.9	1.1	2	1	12.9



FIG. 1. Photograph and drawing of the stained glass fragment MIR 051.

surface and fired so that the silver pigment is integrated into the glass matrix.

This stained fragment from Šaqunda is of major historical interest, both because it is the earliest well-dated example of a silver-stained glass object in al-Andalus and because of its Arabic inscription. The fragment is the rim of a colorless bowl or beaker (Diam. about 12 cm, circumference about 37 cm) (Fig. 1).⁵ It is decorated with vegetal motifs and an Arabic inscription in austere Kufic⁶ that would have run around the entire circumference of the vessel rim. The graphic sequence can be interpreted as “. . . [الحا] جب مما [/ امر بعمله / امر به] . . .” (the *ḥāyib* [chamberlain]. That which [he ordered to make/he ordered]). A close parallel to this vessel, which has a slightly different rim but similar dimensions and chronology and exhibits the same formula (مما امر), was found at Fustat.⁷ The inscription appears to commemorate the commissioning

of the object by a “*ḥāyib*” whose name has not been preserved. This formula is very common at nearby Madīnat al-Zahrā’ in the 10th century, in architectural decorations such as friezes, capitals, bases, and small arches; it is also found on luxurious objects. The formula, in fact, reproduces that

5. The diameter agrees with the standard sizes of stained bowls and beakers from Raya (Egypt). See Yoko Shindo, “Islamic Lustre-Stained Glass from Raya between the Ninth and Tenth Centuries,” *Annales de l’Association Internationale pour l’Histoire du Verre*, v. 16, London, 2003 (Nottingham, U.K., 2005), pp. 174–177.

6. María Antonia Martínez Núñez, “Escritura árabe ornamental y epigrafía andalusí,” *Arqueología y Territorio Medieval*, no. 4, July 1997, pp. 127–162.

7. R[alph] H. Pinder-Wilson and George T. Scanlon, “Glass Finds from Fustat: 1964–71,” *Journal of Glass Studies*, v. 15, 1973, pp. 12–30, esp. pp. 28–29 and fig. 40.

used in inscriptions by the Umayyads in Syria⁸ and by the Abbasids and Fatimids in Ifriqiya.⁹ In al-Andalus, the nomination of *ḥiṣāba* is known from the time of ‘Abd al-Raḥmān I (r. 756–788), but in epigraphy the title of *ḥāyib* has been documented only since the 10th century.¹⁰ The epigraphic evidence therefore suggests that this stained glass object was imported from the Islamic east, possibly from Syria or Egypt.

Similar conclusions can be drawn from the staining technique. Silver staining is believed to have originated in Roman Egypt,¹¹ and examples have been recorded from eighth-century Syria, Jordan,¹² Israel,¹³ and Egypt.¹⁴ Some of the earliest silver-stained epigraphic fragments from the Islamic period were retrieved from Fustat with a Coptic inscription dated to 779 C.E., and from Damascus with an Arabic inscription dated to 786 C.E.¹⁵ As such, the stained glass fragment from Šaqunda is one of the earliest well-dated examples, not only

in al-Andalus but throughout the Islamic world. It is also one of the earliest epigraphic examples in al-Andalus on a non-numismatic support. Other early inscriptions stem from some ceramic finds from Šaqunda¹⁶ and El Tolmo de Minateda (Albacete),¹⁷ and from ring seals from the necropolis of Condestable (Pamplona).¹⁸

The *Kitāb al-Durra al-maknūna*, written by Jābir ibn Ḥayyān (about 721–815), probably at Kufa (Iraq), contains the earliest known recipes for elaborating stained glass. In most cases, the recipes include burnt copper and silver mixed with vinegar, along with other ingredients. Historical and archaeological sources suggest that there were centers specializing in staining in Basra, Kufa, Samarra, Damascus, and Fustat.¹⁹ Chemical analyses have repeatedly demonstrated the use of silver and copper compounds in stained glass decorations.²⁰ No significant elevation of copper was observed in the sample from Šaqunda (Table 1).

8. Markus Ritter, “Umayyad Foundation Inscriptions and the Inscription of al-Walid from Khirbat al-Minya: Text, Usage, Visual Form,” in *Khirbat al-Minya: Der Umayyadenpalast am See Genezareth*, ed. Hans-Peter Kuhnen, *Orient-Archäologie*, v. 36, Rahden/Westfalen: Verlag Marie Leidorf, 2016, pp. 59–83.

9. María Antonia Martínez Núñez and Manuel Ación Almansa, “La epigrafía de Madīnat al-Zahrā,” *Cuadernos de Madīnat al-Zabrā*, v. 5, 2004, pp. 107–158; Samuel Flury, “Le Décor épigraphique des monuments fatimides du Caire,” *Syria: Archéologie, Art et Histoire*, v. 17, fasc. 4, Winter 1936, pp. 365–376; Umberto Bongianino, “The Fatimid Palace at Ajdābiya: New Data and Perspectives,” *Journal of Islamic Archaeology*, v. 2, no. 2, February 2015, pp. 171–193; Bernard O’Kane, “Monumental Calligraphy in Fatimid Egypt: Epigraphy in Stone, Stucco, and Wood,” in *The World of the Fatimids*, ed. Assadullah Souren Melikian-Chirvan, Toronto: Aga Khan Museum in association with the Institute of Ismaili Studies, and Munich: Hirmer Verlag, 2018, pp. 142–159; *idem*, “The Egyptian Art of the *Tiraz* in Fatimid Times,” in *ibid.*, pp. 178–189.

10. María Antonia Martínez Núñez, “La epigrafía de las taifas andalusíes,” in *Tawā’if: Historia y Arqueología de los reinos taifas*, ed. Bilal Sarr, Salobreña, Granada: Alhulia, 2018, pp. 85–118.

11. Stefano Carboni, “Painted Glass,” in Stefano Carboni and David Whitehouse, *Glass of the Sultans*, New York: Metropolitan Museum of Art; Corning: Corning Museum of Glass; Athens: Benaki Museum; and New Haven: Yale University Press, 2001, pp. 199–274.

12. Ahmad Y. al-Hassan, “An Eighth Century Arabic Treatise on the Colouring of Glass: Kitāb al-Durra al-maknūna (The

Book of the Hidden Pearl) of Jābir ibn Ḥayyān (c. 721–c. 815),” *Arabic Sciences and Philosophy*, v. 19, no. 1, March 2009, pp. 121–156; Danièle Foy, “Entre Orient et Occident, le verre islamique (VIII^e–XIII^e siècle): Apports récentes et réflexions sur les échanges et les influences,” *Annales de l’Association Internationale pour l’Histoire du Verre*, v. 20, Fribourg/Romont, 2015 (Rahden, 2017), pp. 10–34.

13. Tamar Winter, *Lucid Transformations: The Byzantine-Islamic Transition as Reflected in Glass Assemblages from Jerusalem and Its Environs, 450–800 CE*, BAR International Series, v. 2946, Oxford, U.K.: BAR Publishing, 2019.

14. Shindo [note 5].

15. Al-Hassan [note 12], p. 126 and references therein.

16. Casal [note 1], p. 127.

17. María Antonia Martínez Núñez, Sonia Gutiérrez Lloret, and Victoria Amorós Ruiz, “Un mensaje en la botella: Escritura árabe en contexto. Un ejemplo de El Tolmo de Minateda,” *Debates de Arqueología Medieval*, v. 6, December 2016, pp. 11–39.

18. María Paz de Miguel Ibáñez, “La ‘maqbara’ de Pamplona (s. VIII). Aportes de la osteoarqueología al conocimiento de la islamización en la Marca Superior,” Ph.D. diss., Universidad de Alicante, 2016.

19. Al-Hassan [note 12], pp. 125–126 and 148–154.

20. See, e.g., Robert H. Brill, “Chemical Studies of Islamic Luster Glass,” in *Scientific Methods in Medieval Archaeology*, ed. Rainer Berger, Berkeley: University of California Press, 1970, pp. 351–377; and *idem*, “Some Thoughts on the Chemistry and Technology of Islamic Glass,” in Carboni and Whitehouse [note 11], pp. 25–45.

In contrast, the base-glass composition of sample MIR 051 is broadly compatible with that of comparable objects. The earlier examples of Islamic stained glasses, dating to the eighth and ninth centuries in Fustat, Tebtunis, and Raya, are also natron glasses of the primary glass group Egypt 2.²¹ For the time being, silver staining in combination with base glasses originating from the Levant is less abundant, with exceptions from Raya (group N1)²² and Apamea.²³ Later examples were typically made of plant-ash glass in line with the spread of the soda-rich plant-ash glassmaking technology in the 9th and 10th centuries.²⁴ The appearance of this remarkable object of Egyptian origin with Arab epigraphy in Córdoba demonstrates the exchange of objects of high economic and symbolic value between the social elites of the Umayyad emirate in Iberia and those of the Abbasid caliphate in the eastern Mediterranean.

21. Foy [note 12], p. 17 and fig. 4; D[anièle] Foy, M[aurice] Picon, and M[ichele] Vichy, "Verres Omeyyades et Abbasides d'origine Egyptienne: Les Témoignages de l'archéologie et de l'archéométrie," in *Annales de l'Association Internationale pour l'Histoire du Verre*, v. 15, New York and Corning, 2001 (Nottingham, U.K., 2003), pp. 138–143; N[orihiro] Kato, I[zumi] Nakai, and Yoko Shindo, "Change in Chemical Composition of Early Islamic Glass Excavated in Raya, Sinai Peninsula, Egypt: On-Site Analyses Using a Portable X-Ray Fluorescence Spectrometer," *Journal of Archaeological Science*, v. 36, no. 8, August 2009, pp. 1698–1707.

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22. Kato, Nakai, and Shindo [note 21], pp. 1703–1704 and table 1.

23. Foy [note 12].

24. Norihiro Kato, Izumi Nakai, and Yoko Shindo, "Transitions in Islamic Plant-Ash Glass Vessels: On-Site Chemical Analyses Conducted at the Raya/al-Tur Area on the Sinai Peninsula in Egypt," *Journal of Archaeological Science*, v. 37, no. 7, July 2010, pp. 1381–1395, tables 1 and 5; Shindo [note 5], p. 176.