Semiprecious Stones and Blue Glass: An Approach to the Imitation Phenomenon in *Hispania* during the Roman Period[1]

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Introduction

The oldest recorded piece of glass – translucent, pale blue-green – corresponds to a molten pre-shaped glass bar originating in *Eshnuna* (Tell Asmar, Irak) dating from *circa* 23rd century BC.[2] The oldest creations were used as ornaments, mostly beads with opaque blue and green inlays.[3] Similarities with stones existed in terms of technical, technological and compositional factors. Originally, gemstones and glass must have been similarly prized. In fact, glass and lapis lazuli were sold as ingots or as part of finished objects meeting similar functions.[4]

Notwithstanding this, bibliography commonly records that glass beads imitate gemstones.[5] Di Giacomo differentiates between actual forgeries (recorded in written sources) and archaeological evidence (which corroborates glass imitations of gems), suggesting that it is highly complex to draw a line between ancient forgeries and imitations, since the latter were probably sold to worse-off buyers who knew what they were purchasing and were not being deceived.[6]

In Near Eastern civilizations and in Egypt the colour blue was associated with the vault of heaven and the divine origin of authority.[7] This colour was introduced into Roman Imperial circuits through trade with the East, and maintained its connotations of power, symbolism and magic. Nonetheless, its use was limited to high-quality or elaborate art products in a demanding and prosperous market during the Julio-Claudian period. This happened not only because resources were limited, difficult to obtain and expensive, but also perhaps because the colour purple was used to identify senators and the Imperial house, which eventually adopted it as its exclusive colour.[8]

This contribution reviews glass pieces *similes* to blue stones whose patterns may have served as models in the Roman period, mainly during the Empire, focusing on those deliberately coloured to simulate gemstones. It excludes very dark blue creations, which imitate jet and obsidian, and the most numerous instances of "natural" colour (greenish-blue).[9]

Ancient written sources provide varying yet significant data regarding several imitation practices and identification strategies. In this respect, it should be recalled that Mesopotamian texts already make references to the manufacture of colours, which were used as substitutes for lapis lazuli, turquoise, carnelian and obsidian.

This contribution is part of the aforementioned investigation project and concerns a series of items originating in *Augusta Emerita* (Mérida, Badajoz), *Celsa* (Velilla de Ebro,

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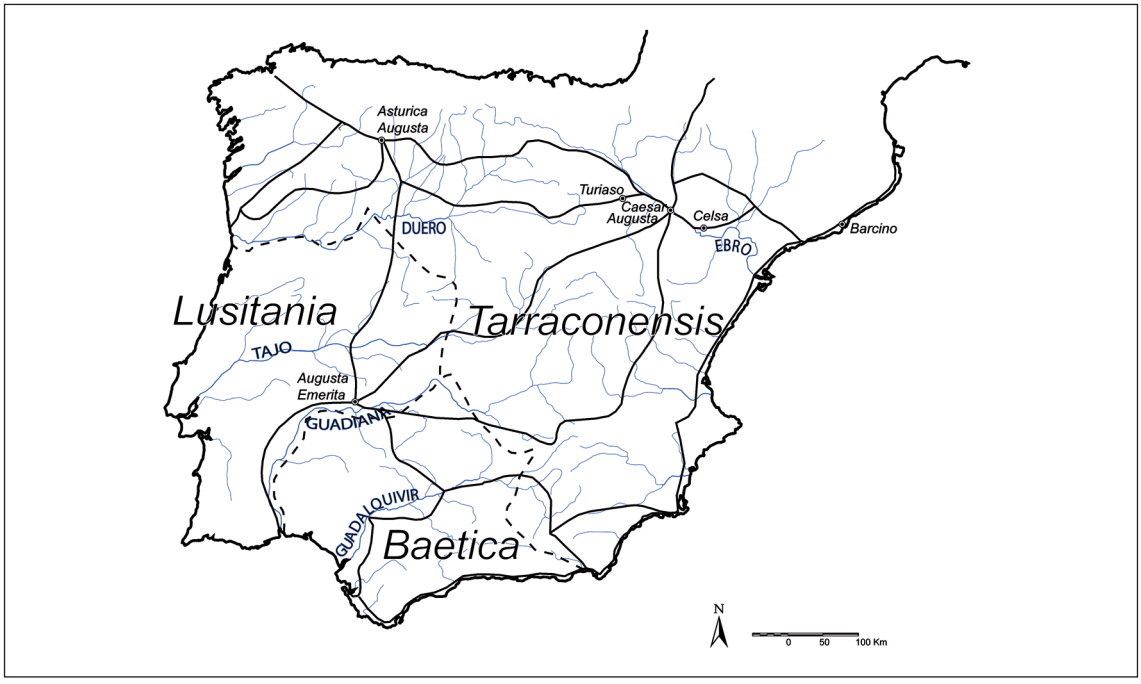


Fig. 1: Location of the studied sites in *Hispania.*

Zaragoza), *Caesar Augusta* (Zaragoza), *Turiaso* (Tarazona, Zaragoza), *Asturica Augusta* (Astorga, León) and *Barcino* (Barcelona), housed at the Museo Nacional de Arte Romano de Mérida, the Museo de Zaragoza and the Museu d'Història de Barcelona, as well as the Museo Arqueológico Nacional (Madrid) (fig. 1).

Blue Stones and Characteristics of Glass *similes*

The analysis is still in process and is vast and complex. Given the limited space we have, we will briefly focus on five gemstones and their glass counterparts.

Lapis lazuli (*sappirus, sapphirus:* Plin., *NH* 36.198, 37.120): This was already mined in northeastern Afghanistan 7,000 years ago.[10] From that region it was taken to enclaves on the high Iranian plateaus such as Shahr-i-Sokhta. Thence it was distributed to the main Mesopotamian spots, where it was used for the manufacture of luxury items.[11] In the Predynastic period it was already being exported to Egypt, where it was mostly used in jewels and personal ornaments, combining prophylactic and aesthetic qualities.

It was used in Roman jewels for engraved intaglios,[12] e.g. the intaglio of Vibia Sabina housed at the National Archaeological Museum of Madrid. Personal ornaments are the most numerous and consist mostly of beads, cabochons and revetment items used in gold and silversmithing in early civilisations.[13]

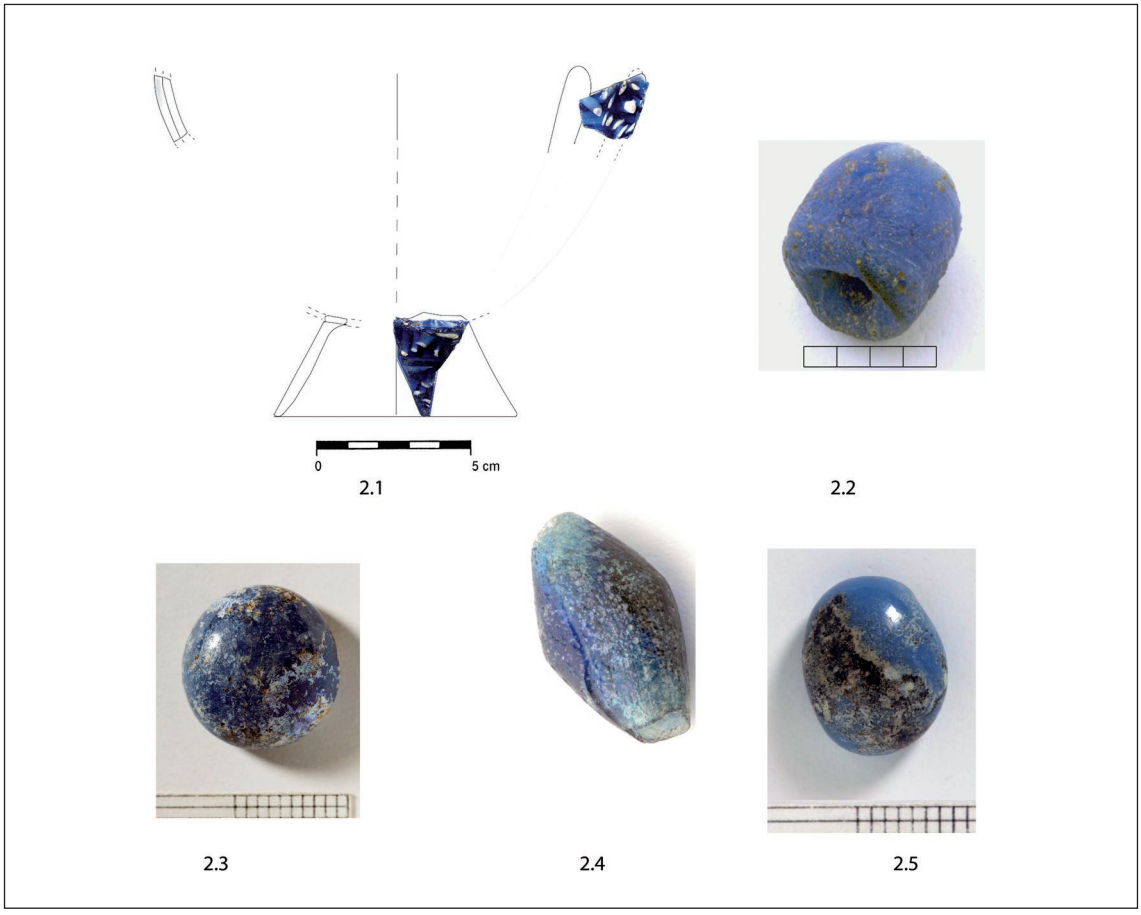


Fig. 2: 2.1. Fragments of pillar-moulded *calix*. Form: Vindonissa 22. Colonia *Celsa. Circa* 60 AD. Museo de Zaragoza, inv. 58689. 2.2. Bead. *Turiaso.* 284 AD. Museo de Zaragoza, inv. 50114. 2.3. Game-counter. Colonia *Celsa. Circa* 60 AD. Museo de Zaragoza, inv. 58689. 2.4. Bead. *Caesar Augusta.* 5th Century AD. Museo de Zaragoza, inv. 50279. 2.5. Cabochon. *Simil* lapis lazuli. Colonia *Celsa. Circa* 60 AD. Museo de Zaragoza, inv. 58259.

In the Roman period, the improvements in glass craftsmanship resulted in the production of open and closed profile vessels used for various purposes, as documented in *Augusta Emerita* and *Celsa* where a white flecked model also exists (fig. 2.1).[14] Beads used for personal ornaments exist in *Caesar Augusta* and *Turiaso* (Tarazona)[15] as well as two counters in *Celsa* (fig. 2.2–5).

Turquoise (*Callaina, Callainus, Callais:* Plin. *NH* 110–112, 147, 151): This was mined in Egypt from the early Dynasties until the Late Period.[16] It was also mined in regions of the Caucasus and Carmania, probably in the Roman period.[17]

The instances found correspond to items for personal ornaments and decoration overlays. In Egypt, however, besides glass, the manufacture of faience used blue glazing

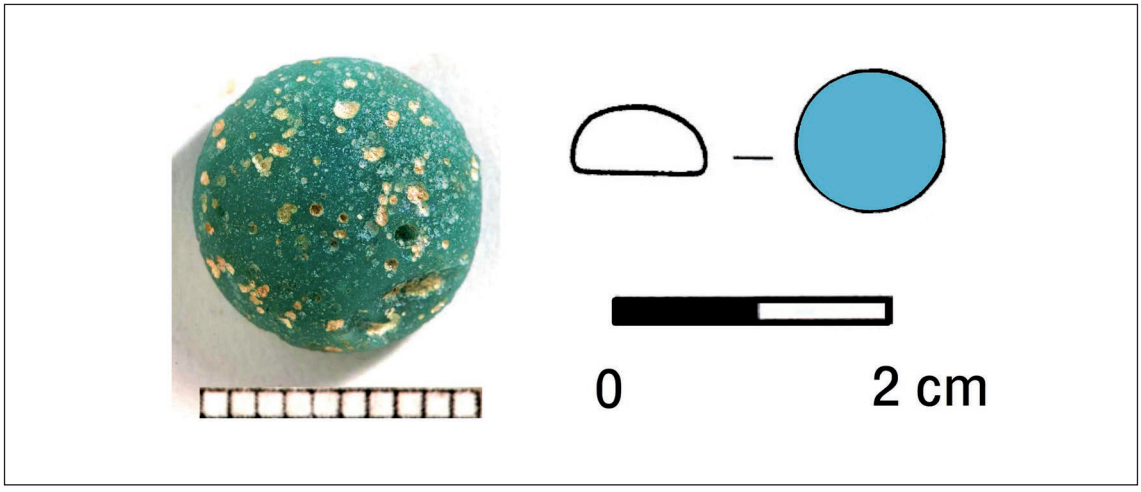


Fig. 3: Glass cabochon. Colonia *Celsa. Circa* 60 AD. ∅ 1,1 cm. Museo de Zaragoza, inv. 58256.

and Egyptian blue or blue frit. Possibly, it was aimed at simulating turquoise or at replacing it either because it was scarce, difficult to obtain, highly coveted or impossible to get as a raw material in the appropriate size.[18]

Evidence of its use in jewels only exists from the Egyptian pre-Dynastic period to the Greco-Roman period.[19] Most instances consist of small opaque glass turquoise blue cabochons used in rings or other ornamental items, i.e. a piece from *Celsa* (fig. 3).

Onyx (blue variant) (*Onyx:* Catull. 66.79; Prop. 2.13b.27, 3.10.19; Hor. *Carm.* 4.12.17; Collumella *Rust.* 12.10; Lucan. 10.114; Stat. *Silu.* 2.6.92; Mart. 6.42.11, 7.9.41, 11.49.3, 12.50; Gell. 19.7; SHA *Heliogab.* 32.2): We will focus on the white and blue banded combination. The type known as *nicolo* agate is conspicuous in intaglios for rings. Its use becomes more frequent in the 1st century BC and in the last centuries of the Empire, perhaps due to the magical properties attached to this material.[20] Some examples housed at the Museo Arqueológico Nacional (Madrid) were manufactured using this stone.

As regards glass, two types may be differentiated:

1. Double glass, highly contrasting opaque blue inside and white outside, was used in cameo carving.[21] The predominant combination consists of opaque white on a translucent or opaque dark blue background, though other combinations also exist: white and purple, white and black, white and brown and exceptionally with three of these colours combined, also exist.This type of glass was not very common. In tableware it is usually linked to wine. Known instances include the Portland Vase and the Getty Cup. We have documented its use in a cameo originating in Astorga (fig. 4.1).

2. Opaque blue glass with two contrasting blue layers *similis* to "*nicolo* agate" and used in intaglios. No blue vessels are known whose decoration is based on this type of pattern using two colours. It was exclusively used to make seals for rings, the same as

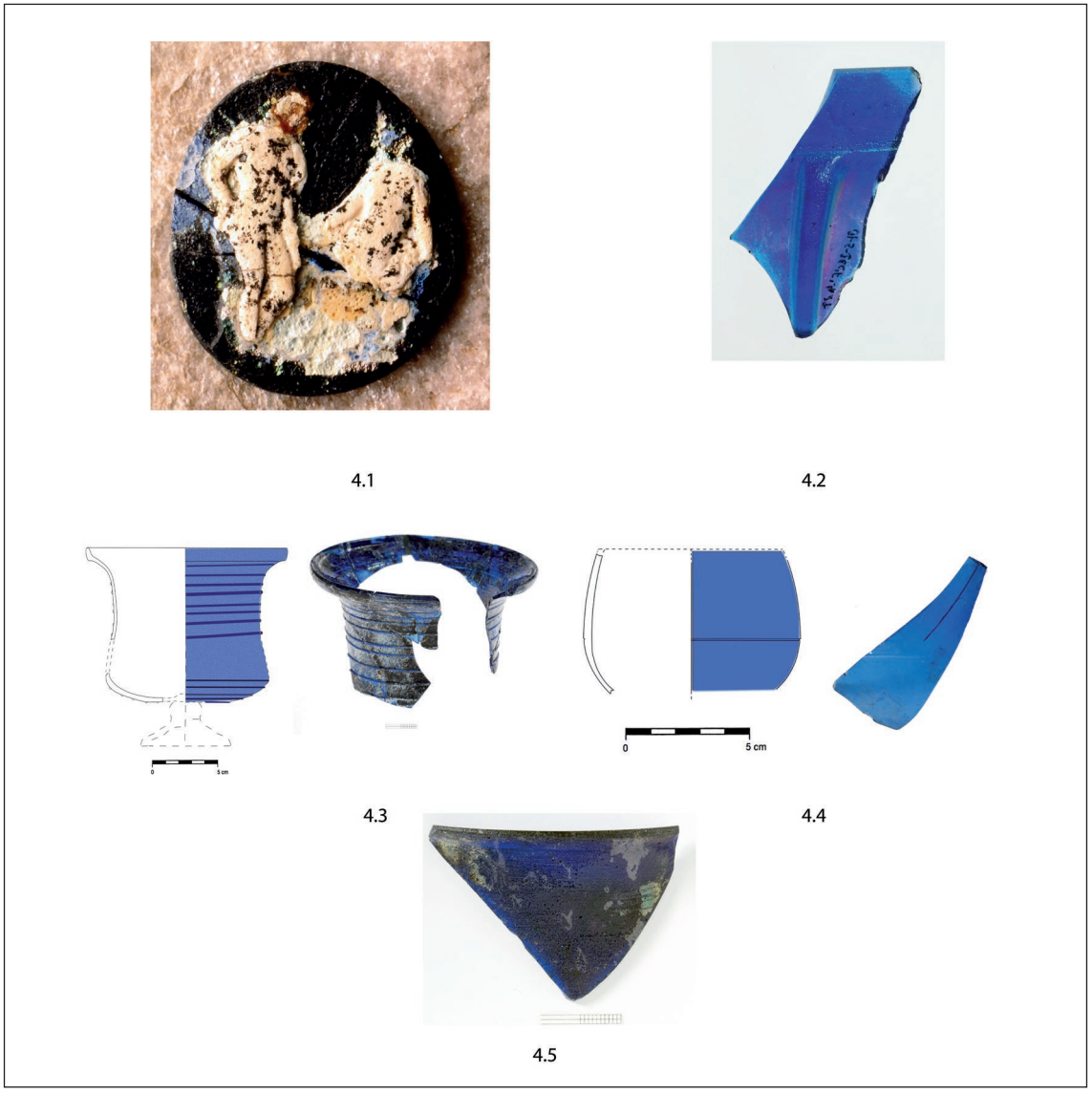


Fig. 4: 4.1. Cameo glass. *Asturica Augusta.* Museo Romano de Astorga, inv. AA.CS10. 90.3058. 4.2. Isings 3b. *Caesar Augusta.* 50–60 AD. ∅ 16 cm. Museo de Zaragoza, inv. 58337. 4.3. *Charchesium.* Isings 36a. Colonia *Celsa.* 65–68 AD. ∅ 15 cm. Museo de Zaragoza, inv. 29924. 4.4. Isings 12. *Caesar Augusta.* 55–60 AD. ∅ 8 cm. Museo de Zaragoza, inv. 57096. 4.5. Isings 37c. *Caesar Augusta.* 55–60 AD. ∅ 10,5 cm. Museo de Zaragoza, inv. 58297.

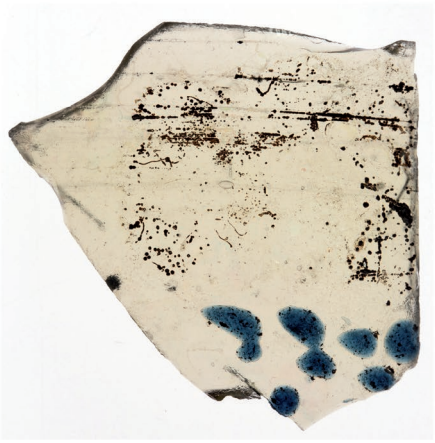
the original gemstone; a workshop of glass skeuomorphs may have existed in *Bracara Augusta.*[22]

Sapphire (*Cyanos:* Plin., *NH* 37.119; *App. Verg. Dirae* 37)[23]: Commonly used in jewellery since the Hellenistic period, in particular from Augustus onwards, once the east Mediterranean trade routes had become established. Its use was boosted from the 2nd century AD on as jewellery evolved towards the use of polychromy and the combination of materials.

It constitutes the largest group of bright translucent or transparent blue glass. Documented vessels typically consist of Roman luxury tableware. In *Celsa, Caesar Augusta* and *Barcino* several instances exist. It has been documented in Isings 3b, 12, 36a and 37c. It occurs in *Celsa* and *Caesar Augusta* (fig. 4.2–5). In the former an uncut piece of glass was found probably imported from an Italian workshop and intended for the manufacture of vessels using the free glassblowing technique.[24]

Particularly remarkable are three fragments of beakers with cabochons simulating sapphire gemstones in the style of *gemmata potoria* made of precious metals: one originates in San Román (Castiliscar, Zaragoza)[25] and the other two in *Caesar Augusta* and *Augusta Emerita,* respectively. They all date from the late Roman period (fig. 5).

It was used in beads for earrings and necklaces combined with gold and occasionally with other gemstones,[26] as well as in jewellery and in intaglios for rings.[27]



5.1

5.2

Fig. 5: 5.1. Isings 96b2a. San Román (Castiliscar, Zaragoza). 360–380 AD. Museo de Zaragoza, inv. 59115. 5.2. Alcazaba (Mérida, Badajoz). Museo Nacional de Arte Romano de Mérida, inv. DO34431.

Translucent dark blue glass beads are also very numerous. They correspond to necklaces and feature various shapes, i.e. lenticular, biconic, faceted with bevelled angles (fig. 6.1–3). Their production began in the Roman period,[28] clearly imitating faceted gemstones – or combining spherical beads of translucent gemstones, probably sapphire, with others similarly shaped in glass.

It appears towards the second half of the 3rd century AD, with a long-lasting presence up until the year 400 AD,[29] some instances even existing through to the 6th century AD.[30] A small circular bezel from *Caesar Augusta,* representing a sexless human face[31] and a fragment of a stirring rod from *Barcino* are particularly remarkable (fig. 6.4–5).

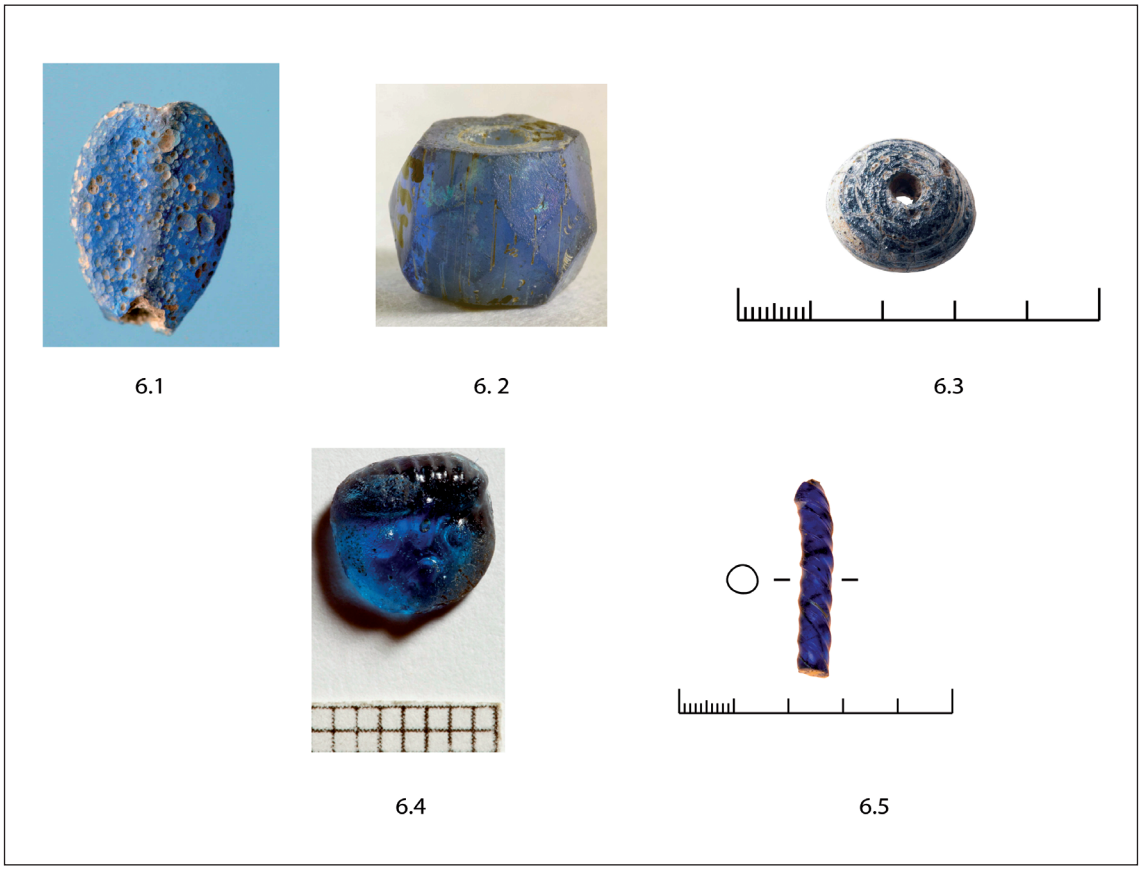


Fig. 6: 6.1–2. Glass beads. *Augusta Emerita* (Mérida). H 1,37 cm & 0,534 cm. Museo Nacional de Arte Romano de Mérida, inv. CE07338 & CE00435. 6.3. Glass bead. *Barcino* (Barcelona). 3rd Century AD. Museu d'Història de Barcelona, inv. MHCB 13375. 6.4. Round chaton glass with moulded full-face. *Caesar Augusta.* 3rd Century AD. Museo de Zaragoza, inv. 50340. 6.5. Twisted rod fragment (broken at both ends). *Barcino.* 40–68 AD. Museu d'Història de Barcelona, inv. 43330.

Aquamarine (kind of *beryllus:* Plin., *NH* 37.76–9; Prop. 4.7.7; Juv. *Sat.* 5.37; Claud. *Epitalam.* 87): This is a variety of beryl and Pliny seems to refer to it when describing oriental emeralds (NH 36.76).[32] In the ancient period beryl was chiefly extracted in India,[33] though the best mine is located in the eastern desert of Egypt, whose working started in the late Ptolemaic period and continued until the early Byzantine period.[34]

Two inscriptions from the province of Granada (CIL II, 2060; CIL II, 3386) could attest to its relevance and value if we accept the interesting opinion of Warmington that the word *cylindri,* used in both, could refer to beryl or aquamarine perhaps due to the shape of the beads made with this gemstone.[35] However, Pastor and Mendoza believe that *cylindrus* refers to an unknown or unidentified gemstone.[36]

The "natural" colour glass used in small objects for personal ornaments may be linked to the simulation of aquamarines given the tradition documented for other gemstones. Several shapes exist: lenticular (especially used in intaglios), oval and four-sided. The last case presents bevelled edges. For that reason it was undoubtedly intended to be set in a bezel (fig. 7).

Fig. 7: 7.1. *Barcino.* 4th Century AD. Museu d'Història de Barcelona, inv. 16730. 7.2. *Barcino.* 1st Century AD. Museu d'Història de Barcelona, inv. 3497.

Conclusions

Some preliminary considerations may be put forward despite the fact that the investigation work in progress is highly complex.

Lapis lazuli and sapphire were the gemstones more often imitated in glass. They shared symbolic and physical similarities and display a common terminology in the early stages, which could explain why they featured common characteristics in glass beads.

Blue was the most significant colour for centuries in core-formed glass and one of the favourite colours of Ennion, one of the most remarkable glassmakers. In the Roman period, the colour blue in vessels mostly corresponds to the central years of the 1st century AD, as data from *Celsa* show in our analysis. Vessels constitute the most significant category in terms of quality and quantity, in particular those used for drinking – especially wine – and for personal use. The most exclusive items corresponded to Imperial gifts and *dona militaria.* The raw glass chunks from *Celsa* attest to the existence of trade to meet the demand for this colour used in special vessels and to the fact that a glass-blowing workshop existed in this colony in the mid-1st century AD.[37]

In the late Empire, 4th and early 5th centuries, it was mostly relegated to applied decoration, the most common consisting of drops or coiled threads. Vessels made of this colour were rare and consisted of exceptionally high-quality products such as the bowl depicting Old Testament images from the necropolis of Köln-Braunsfeld.[38]

As regards personal ornaments in the early Empire – once Egypt and the oriental Mediterranean had been annexed – the silk road supplied a market increasingly avid for luxury products including gemstones as has been documented regarding a wide variety of stones. In terms of architecture, in the 1st century blue wall plates are used exclusively in lavish pieces and included bicolour cameo glass or monochrome with moulded decoration of various motifs.[39] As regards *tesserae,* they emerged in the late 2nd century and continued to be used for centuries afterwards.

Discerning between genuine gemstones and glass is a recurrent topic in classical literature. Pliny refers to a series of blue stones, some of which could have been imitations, though it is not always possible to establish scientific links to catalogued rocks or minerals (fig. 8).

According to Tacitus (*Ann.* 3.55), the epitome of luxury at the table concentrated around the Julio-Claudian period, a fact confirmed by stratigraphies in *Celsa* and *Caesar Augusta,* and in other sites such as Magdalensberg. When referring to gemstones authors (see Clement of Alexandria's moral views, *Paed.* 2.118.1) usually highlight glass worthlessness. In this sense, Martial uses *gemma* to denote glass as a material (4.22.6; 8.68.5 concerning the plates in a greenhouse), though he claims it is a cheap gem (*uilis gemma*) compared to precious stones (12.74.4).

Lapis lazuli	*Sapp(h)irus*
Turquoise	*Callaina*
Chalcedony	*Iaspis* (?), *Aegyptilla* (?)
Agate	*Achates*, *Onyx* (?)
Onyx	*Onyx*, *Sardonyx*
Aquamarine	*Beryllus*, blue variety
Sapphire	*Cyanus* (?), *Hyacinthus* (?)
Anhydrite	*Ceraunia* (white stone possible with blue shine)

Fig. 8: Possible correlation between old designations of blue stones (or blue varieties thereof) and modern terminology.

Notes

[1] This paper is part of the Research Project *Ficta Vitro Lapis: Glass imitations of stones in Roman Hispania* (HAR2015-64142-P) (MINECO/FEDER, UE) funded by the Ministry of Economy, Industry and Competitiveness of the Government of Spain.

[2] Barag 1970, 133.

[3] Caubet – Pierrat-Bonnefois 2005, 21.

[4] Cummings 2002, 104.

[5] Swift 2003, 337.

[6] Di Giacomo 2016, 67 f.

[7] Ioannidou 2006, 202–204.

[8] Bradley 2009, 189–211.

[9] Besides those considered here, ancient texts provide information about different blue or blue shaded gemstones. Their names, though identical to modern ones, do not necesarily refer to the same stone: Jasper (*iaspis:* Plin., *NH* 37.115-8; Juv. *Sat.* 5.42; Verg. *Aen.* 4.261; Lucan. 10.122; Stat. *Theb.* 4.265, 7.652; Mart. 5.11; Claud. *Raptu* 2.40, *Epitalam.* 87, *4 Cons. Hon.* 589, *6 cons. Hon.* 523, *Epigrammata Bobiensia* 18); Sardonyx (*Sardonyche,* i.e., sard, 'carnelian' + onyx, 'nail': Plin., *NH* 37.85–89, 37.197; Pers. 1.13; Mart. 2.29, 4.28.1, 4.61, 5.11, 6.59, 10.87, 11.27, 11.37); Agate (? *Achates:* Luc. 10.114, palace of Cleopatra; Plin. *NH* 37.5; Claud. *Epitalam.* 87); Anhydrite (*Ceraunia*?*:* Plin., *NH* 37.134).

[10] Wyart et al. 1981, 184.

[11] Casanova 2013, 217 f.

[12] Marshall 1911, cat. nº 2663 and 2997; d'Ambrosio – de Carolis 1997, cat. n. 112.

[13] Casanova 2013, 165–197.

[14] Paz 1998, 525 fig. 244,4a. 4b.

[15] Ortiz 2001, 265–267 fig. 73, nos. 2 y 4.
[16] Harrell 2012.
[17] Warmington 1928, 255.
[18] Nicholson 2012, 16–21.
[19] Aston et al. 2000, 62.
[20] Warmington 1928, 240.
[21] Painter – Whitehouse 1990.
[22] Da Cruz 2009, 10.
[23] Di Giacomo 2016, 36 identifies it with *Hyacinthus* (Plin. *NH* 37.125–126).
[24] Paz 1998, 530 figs. 259 and 330.
[25] Ortiz 2001, 307 fig. 78,2, Isings 96b2a.
[26] Marshall 1911, cat. nos. 2362 and 2686.
[27] Marshall 1908, cat. nos. 798 and 815; Warmington 1928, 248 f.; D'Ambrosio – De Carolis 1997, cat. no. 112; Spier 2007, cat. no. 140.
[28] Spaer 2001, 64.
[29] Riha 1990, 90 f.; Foy 2010, 467 f.
[30] Guido 1978, 99 f.
[31] Ortiz 2001, 348 f. fig. 110,1.
[32] Warmington 1928, 250.
[33] Di Giacomo 2016, 32.
[34] Harrell 2004, 70.
[35] Warmington 1928, 251. This opinión is also defended by Di Giacomo 2016, 72 f.
[36] Pastor – Mendoza 1987, 172.
[37] Paz 1998, 529–531 figs. 259 and 330.
[38] Harden et al. 1987, 16, 25–27.
[39] Boschetti et al. 2012, 142.

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Fig. 1: adapted by J. M. García Rodríguez, University of Cantabria, from various sources. – Fig. 2: 1–5. J. Garrido. Museo de Zaragoza. – Fig. 3: Desing: E. Ortiz. Photo: J. Garrido. Museo de Zaragoza. – Fig. 4: 4.1. M. Amaré. 4.2–5. J. Garrido. Museo de Zaragoza. 4.3–4: Desing: E. Ortiz. – Fig. 5: 5.1. J. Garrido. Museo de Zaragoza. 5.2. CERES. S. González Gómez. – Fig. 6: 6.1–2. Archivo MNAR. L. Plana. 6.3. MUHBA. 6.4. J. Garrido. Museo de Zaragoza. 6.5. MUHBA. – Fig. 7: 7.1–2. MUHBA. – Fig. 8: A. Encuentra.

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