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# Ring-eye blue beads in Iron Age central Italy – Preliminary discussion of technology and possible trade connections

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ABSTRACT

The Iron Age was a remarkable period in glass technology development and its spread across the Mediterranean. Communities that populated what is nowadays Central Italy underwent profound changes during this period forming more complex societies, developing proto-urban and urban centres, and incorporating into a wide trade network of the Mediterranean Sea and beyond. Glass objects in that small region are frequently found in burial sites dated to the first half of the first millennium BCE, with small blue beads with simple ring eyes being among the most abundant types. Fifty-six objects of this type (both whole beads and fragments) were studied with a non-invasive approach by means of Optical Microscopy, Fibre Optics Reflectance Spectroscopy, and portable X-ray Fluorescence spectroscopy. The analyses were conducted at the Museo Nazionale Etrusco di Villa Giulia and at the Museo delle Civiltà (both in Rome, Italy). Five samples from the main set were also analysed with a Scanning Electron Microscope coupled to an Energy Dispersive Spectrometer. The data gave preliminary information on the raw materials used to prepare the glass, the manufacturing techniques, and offered some hints to (tentatively) locate the region of provenance. In particular, the analyses established that the beads are soda-lime-silica glass and the source of cobalt, used as the blue colorant, could be an ore from Egypt. Within this general frame, a smaller group showed a different compositional pattern. These preliminary results contribute new knowledge for tracing exchange routes within the Mediterranean during the Iron Age.

## 1. Introduction.

This study is the first systematic investigation - performed mainly through a non-invasive approach - of ring-eye blue beads, which are among the earliest glass bead types from the Early Iron Age (EIA) contexts in the Italian peninsula. Because such beads are frequently found, the archaeological inferences can take great advantage from the determination of the chemical composition of the glass. Compositional homogeneity - or heterogeneity - within a set of beads can, in fact, give clues to define at least the number of glass-making sites that were covering the demand of such items. Moreover, in some instances, compositional features may give useful information to locate the production sites (Shortland et al. 2007; Conte et al. 2016; Oikonomou et al. 2018; Costa et al. 2021). The beads considered in this work were found in nine archaeological sites in the present-day Lazio region of Italy. These sites belong to two different historic regions, commonly named Southern Etruria (Capena, Cerveteri, Falerii, Narce, Veio and Vulci) and Latium (Marino, Osteria dell'Osa and Sermoneta) in the IA archaeological scholarship. The position of the sites is reported in Fig. 1, which shows a map of the Italian peninsula.

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