

## Beyond provenance: interpreting the Pb isotope composition of lead white pigments found on Andean ritual drinking vessels from the colonial era

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Lead (Pb) isotopes are a widely used tool used for identifying or constraining the geologic origin of diverse types of archaeological and cultural materials within museum collections. Here, we discuss the application of Pb isotopes to study lead white pigments applied to Andean wooden ritual drinking vessels (“qeros”) (Fig. 1). Qeros represent an important form of indigenous artistic expression during the colonial period in the Andes. However, it is difficult to assign precise dates to these vessels and little is known about the artists who created them or where workshops were located. Further, the provenience and collections histories of most colonial qeros held in museums are poorly known.

Here, we show how Pb isotope analysis of lead white pigments can enrich our knowledge of these objects. We analyzed pigment samples removed from 20 colonial qeros, most of which reside in the collections of four major U.S. museums: the Smithsonian National Museum of the American Indian, the American Museum of Natural History, the Brooklyn Museum of Art, and the Metropolitan Museum of Art. Based on Pb isotopes, we argue that Andean artists used lead white pigments derived from both European and Andean sources. However, the Pb isotope measurements provide insights beyond the origin of the pigments. Although most of the qeros have no known association with one another, their lead white pigments fall into just three internally consistent groupings in Pb isotope space. The presence of shared isotope signatures among different vessels may indicate that there were a limited number of workshops where qeros were produced and/or imply the sharing or controlled distribution of prepared pigment batches or raw materials. Further, by combining isotopic and stylistic evidence, we suggest that the use of pigments from different sources may have had a chronological component. The success of this study highlights the benefits of studying similar objects held by different museums and demonstrates how combining geochemical measurements with other forms of evidence (e.g., ethnohistorical, stylistic) can enhance the interpretation of museum objects.



Figure 1. National Museum of the American Indian, Smithsonian Institution (17/5445). Photo by Ernest Amoroso. Height 14.2 cm.