Bulletin of the National Museum of Japanese History
Vol.230 December 2021

Lead Isotope Analysis of Lead-containing Pigments Taken from Early Modern Objects in Yamagata Prefecture

SAITO Tsutomu

A lead isotope analysis was conducted on the wooden sculptures stored in the temples of Yamagata Prefecture to test for red lead pigments. The sculptures were made at the late Edo period and the first half of the Meiji period (19th century). Based on previously reported lead ore isotope ratios and references to the trade of lead pigments, the production areas of lead pigments were estimated.

Six out of seven samples, when compared to the lead isotope ratios, indicated that Daira, or Osarizawa in Akita Prefecture, Funauchi in Aomori Prefecture, and Budō in Niigata Prefecture were possible lead mining areas. Historical documents from the lead pigment production company which was active in the 18th to 19th centuries in Sakai, Osaka, mining conditions of the mines and historical background were taken into consideration, and it was concluded that Daira was most likely the origin.

One sample shows slightly different ratio from the others. This indicates that the lead did not originate from one mine but from a mixture of lead collected from several mines to produce the pigment.

Keywords: Yamagata prefecture, red lead (minium), pigments, lead isotope ratio, Daira mine, Akita prefecture