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CONNECTING PLACES: THE MATERIAL QUALITY AND PROVENANCE OF ANCIENT PIGMENTS

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Cinnabar (α-HgS, mercury sulfide) forms a bright red pigment when powdered, was expensive and likely widely traded within the Roman Empire. The provenance of raw materials and the use of pigments can reveal how ancient societies were interconnected. Through a combination of pigment surface- and cross section analysis, as well as trace element analysis, we evaluate pigment preparation, raw material quality and provenance of 29 wall painting fragments from Roman Ephesus (western Turkey). Samples were collected from several rooms and living units of Terrace House 2 and Terrace House 1. They were analyzed using optical microscopy and SEM-EDS on cross sections; additionally, surface topography was studied by SEM-EDS. Elemental analyses (by portable XRF and ICP-MS) hint at a preference for combining cinnabar with Fe-rich pigments (earth pigments) rather than with Pb-rich pigments (minium, red lead), which was also confirmed by SEM-EDS analysis. While ochre was often used as an underpainting layer, EDS measurements exclude the prevalence of pigments other than cinnabar on the top layers. Likewise, EDS was unable to determine statistically relevant variation in the stoichiometry of the cinnabar pigment grains. Optical and scanning electron microscopy revealed that there is significant variation in both pigment morphology and surface distribution. These observations suggest that chromatic variation of the final paint layer is likely due to differences in production and application of the cinnabar paint from a single mineral source. Lead isotope analysis of these samples also hints at the use of cinnabar from a similar source (age, location) and/or consistent mixing of cinnabar from similar sources. This work on the use, quality and provenance of archaeological pigments contributes to reconstructing economic networks that existed between Roman provinces.

Keywords
Ancient polychromy, Pigment morphology and chemical composition, Trade in pigments

Note/comment