The Significance of Surface in Central African Masks: Pigment Identification of Polychrome Wood Masks from the Congo
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Abstract: The treatment of surfaces in African masking traditions reflects the adaptation of materials for cultural ritual and use. This poster presents a study of polychrome surfaces using microscopic and microanalytical techniques, whose results provoke questions regarding the masks’ methods of manufacture, material adaptation, dating and provenance. The coloring materials of different chemical composition and microstructure were sampled from a group of eight polychrome wood masks from the Kuba region of the Democratic Republic of Congo and now in the collection of the Fowler Museum at UCLA. Following a thorough non-invasive investigation employing forensic imaging, X-ray fluorescence (XRF) spectroscopy and ultraviolet, visible, near infrared (UV/Vis/NIR) spectroscopy, dispersion and cross-section samples of the wood and paint layers were analyzed using polarized light microscopy (PLM), scanning electron microscopy (SEM) coupled with energy dispersive X-ray spectroscopy (EDS) and X-ray diffraction (XRD) in order to ascertain their chemistry and composition. The results indicated that while all eight masks analyzed shared common iconographic and stylistic characteristics, six masks exhibit similar materials with only two of the masks being outliers.

Results: Multi-analytic analyses using non-invasive, micro-destructive, and surface examination methods enabled identification of the pigments used in the masks’ manufacture, and facilitated comparison of techniques and materials utilized within the group. PLM enabled direct observation of optical and physical characteristics relating to particle size, habit, relief, and color under plane polarized light, as well as observation of birefringence and interference colors under crossed polarized light illumination. The masks appear to have been constructed from a tropical wood and painted with pure or mixtures of pigments in single layers. The colors were applied with an organic binding medium, most likely palm kernel oil, and include: iron oxides and hydroxides (red and yellow ochre), kaolinite white, smalt, ultramarine, carbon black, and possibly Tukula paste (powdered wood from an African tree of the Pterocarpus genus). The consistent identification of bromine (Br) in both painted and unpainted surfaces was noted, while the presence of lithopone on mask 381.259 provides a terminus post quem of 1874 (Pigment Compendium. Oxford: Butterworth-Heinemann, 2008: 248).

Conclusions: Microscopy and microanalysis are indispensable in the deduction of cultural heritage material manufacture. Characterization of the materials and methods of mask production guide our inquiry of Kuba art and ritual practice, and may direct proper methods of the masks’ handling, storage, display, and conservation. The examination raises several questions regarding the stability of the materials utilized in the masks’ manufacture; the identification and characterization of these materials allows us to predict the potential deterioration of cultural artifacts. Both the organic components and mineral pigments employed are susceptible to environmental factors, such as UV light exposure, pH, relative humidity and temperature fluctuations. For example, the presence of kernel oil in the brown paint on X67.2127 means that it is highly susceptible to damage from heat (even at elevated ambient temperature values). Moreover, the identification of organic salts present on the surface of masks X72.L147 and 381.259, if confirmed, may be the result of inappropriate storage conditions or previous conservation treatments. These risks require further investigation and could direct future research and the selection of appropriate storage conditions. This highlights the role of microscopy and microanalysis in the study of Kuba masking traditions.

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