ART BIO MATTERS

POSTER: A Preliminary Workflow Towards the Integrative Authentication and Dye Analysis of Ancient Peruvian Textiles at the Detroit Institute of Arts

Joshua Henkin, Ruth Ann Armitage & Christina Bisulca
Field Museum

In 1926 fifty-six Peruvian textiles were purchased for the Detroit Institute of Arts (DIA) from the Fritz Gurlitt Gallery in Berlin. Aside from what description does exist of the dimensions, iconography, and materiality of these objects, they are presumed to be from prior to 1000 CE/"pre-conquest" solely based on catalog card notes. For an integrative and complete approach to the authentication and characterization of these textiles, a collaboration between Eastern Michigan University and the DIA was initiated. Extant DART-MS (direct analysis in real time-mass spectrometry) data exists for the Peruvian dyestuff reference materials collected by Kay Antúnez de Mayolo in the 1970's, which can be compared to any dyes from the Gurlitt Gallery textiles. A combination of FTIR spectroscopy, Vis-NIR spectroscopy, X-ray fluorescence, and microscopy is used to study sampled fibers nondestructively, while a combination of LC-DAD and DART-MS are used with sample extraction and micro-destructive pyrolysis to gain further information on the chemistry of natural dyestuffs and fibers. Preparation of cotton, camelid fibers, and other organic materials from these textiles for plasma-chemical oxidation/accelerator mass spectrometry (PCO-AMS) analysis for radiocarbon dating represents the second micro-destructive step towards the authentication of these materials. Funding permitting, a combination of fibers can be used to verify the claims for individual objects as well as the lot. A new LC-MS (liquid chromatography-mass spectrometry) system may eventually be used to further examine and characterize the textile dyes as well as the extant reference materials (Peruvian dyestuffs), moreover, with the aim of potentially differentiating between sources of dyestuffs, even in congeners (from the same botanical genus) with the same dye chromophores despite being different species of plants. In this case, the tools associated with the Global Natural Product Social Molecular Networking (GNPS) site may be employed to make sense of the chemical space for sets of similar LC-MS data. The radiocarbon dating along with the characterization of the materiality and analytical chemistry of the dyestuffs and fibers will help to elucidate the cultural context in which these textiles were produced, even if the exact provenience beyond Peru ends up being speculation that is lost to time.

info@artbiomatters.org
https://www.artbiomatters.org/