Black Walnuts as a Potential Source of Paint on Roosevelt Redware

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Introduction

The Dinwiddie site (LA 106003) is a Cliff-phase (ca 1300- 1450 CE) Salado pueblo in the Upper Gila region of southwestern New Mexico. Archaeology Southwest has operated a field school at the site in conjunction with the University of Arizona from 2013-2015. The decorated pottery assemblage at Dinwiddie is dominated by Roosevelt Redware (also known as Salado Polychrome), which dates from about 1280 to 1450 CE. This class of pottery is found throughout much of Arizona and New Mexico and serves as a hallmark of the Salado Phenomenon.

Dinwiddie Polychrome bowl from the Mills Collection at Eastern Arizona College; an example of Roosevelt Redware. Photo courtesy of Archaeology Southwest.

The Dinwiddie site, designated by a red star, in the context of the Upper Gila Area. Map by Catherine Gilman.

Background

The black paint on Roosevelt Redware is almost always carbon-based. Bee weed (*Cleome serrulata*) is commonly mentioned as a source in ethnographic studies, and produces a smoky, diffuse appearance that is familiar to those who study Salado wares. At Dinwiddie, however, researchers have encountered significant amounts of Roosevelt Redware decorated with what looks like black mineral paint, an anomaly investigated recently by Hannah Zanotto (NAU). Using X-Ray fluorescence (XRF) and Laser-ablation inductively coupled plasma-mass spectrometry (LA-ICP-MS) Jeffrey Ferguson (MURR) determined that the paint in question was, in fact, organic despite its appearance. Unfortunately, analyses cannot identify the plant species used. Cynthia Luna, a Native American artist who lives near Dinwiddie, suggested that Salado potters may have used the seeds from black walnut trees (*Juglans major*) to make black paint. These trees are found along Duck Creek and the Gila River. Luna learned to make black walnut paint as a child, but never knew of it being used on pottery. The present study was designed to determine whether black walnut paint, if used on pottery, would produce post-firing results similar to those seen on archaeological samples from Dinwiddie.

Method

Two batches of black organic paint were prepared in accordance with ethnographically-documented means that involved the reduction of plant material through boiling. One batch was made from bee weed, while the other was made from black walnut seeds gathered on the site. Both batches of paint were of the same overall consistency. Pottery was made, using a natural clay and traditional methods. Separate samples were decorated using both types of paint. Designs were applied in similar ways and to a consistent thickness. The pottery was then fired in a modern kiln to ensure identical temperatures and atmospheric conditions.

Bee Weed (*Cleome serrulata*) in bloom. Photo by Matt Lavin via Wikimedia Commons.

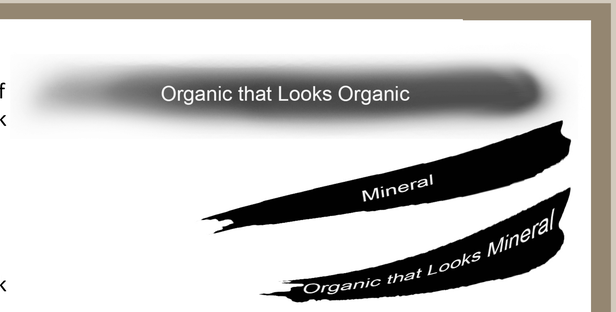
Unripe black walnuts (*Juglans major*) in a tree. Photo by Whitney Cranshaw via Wikimedia Commons.

Results

After firing, the test pottery was compared to archaeological samples of Roosevelt Redware. Pottery decorated with bee weed-based paint was visually similar to the more typical black encountered on most Roosevelt Redware**. In contrast, pottery decorated with black walnut-based paint was decidedly mineral-looking, and quite similar to the Roosevelt Redware at Dinwiddie.**

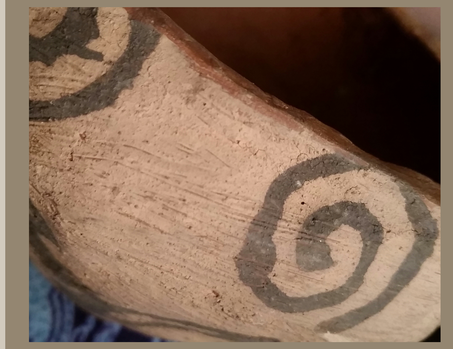
Carbon paint:
Made of plant materials; edges of lines generally look blurry.

Mineral paint:
Made of mineral pigment; edges of lines generally look sharp



Discussion

As Zanotto and others showed previously, some organic paint can be mistaken for mineral paint when macroscopic means of identification are used alone. The production of organic paint that looks mineral-based likely involves the use of a heretofore unknown plant recipe. The plant species used, however, cannot be identified using current archaeometric methods. The present study used indigenous insight and local materials to investigate one possibility: black walnut. Our results indicate that black walnut paint, while purely organic, can look convincingly mineral. Thus, while we are not arguing that Salado potters in the Cliff Valley *did* use black walnut, we suggest that it is possible that the locally-abundant resource may have been used in this way.



Black walnut paint after firing in modern kiln; lines have sharp edges.

Future Research

By nature, experimental archaeology produces insight and potential, rather than absolute answers. Our results are promising, but raise a number of questions and beg further work. For example, the distribution of mineral-looking-but-carbon-based paint can be compared to that of *Juglans major*, both historically and in paleobotanical samples. Variability in paint recipes and firing atmospheres can also be explored, as Andy Ward is currently doing. With luck, chemical analyses may one day be able to identify plant species in post-combustion contexts.

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