Pomegranate - rich in tannic acid.

Hall, A.J. and Photos-Jones, E. 2002. The juice of the pomegranate: Quality control for the processing and distribution of *alumen* in antiquity. 33rd International Symposium on Archaeometry. 22-26 April 2002 Vrije Universiteit, Amsterdam, The Netherlands. Program and Abstracts. Abstract 049, p42.

Abstract

The Aegean island of Melos was well known in antiquity for the industrial mineral (IM) *'alumen*' as well as sulphur and Melian Earth. While the technology of processing insoluble minerals for pigments and other products must depend mainly on their physical properties, *alumen* is soluble and it is its chemical properties which were undoubtedly of importance in its processing as well as uses. Pliny (AD 1st Century) praised Melian *alumen* and stated that its *purity* could be tested using pomegranate juice and oak galls.

Our research, which forms part of a project on IMs in Antiquity in the Aegean, is endeavouring to establish the nature, origin and sources of Melian *alumen* as well as methods used in its extraction and processing. Melian *alumen* was probably an efflorescent salt, an aluminium-sulphate mineral (alunogen) with variable amounts of K, Na, Mg and Fe sulphates, which formed readily workable deposits at sulphurous fumaroles in the post-volcanic but geothermally active landscape of SE Melos. XRD, SEM with EDAX, ICP-AES, stable isotope analyses and computer modelling of chemical solutions have been used to characterise and understand the origin and properties of the efforescent salts. We have confirmed that pomegranate juice and oak galls, both rich in gallo-tannic acid, are very effective in detecting impurities, especially iron, thus we are starting to elucidate aspects of what must have constituted “quality control” in the IMs trade in antiquity.

Purification in Roman times, especially for medical applications, could have been achieved by fractional crystallisation in solution using convenient low temperature geothermal energy at Aghia Kyriaki, a coastal site on Melos characterised by an abundance of 'industrial' pottery sherds. Our field and laboratory experiments are providing a better understanding of *'alumen*', the "aspirin of antiquity" which had many diverse applications before it became a major industrial chemical in the medieval period. This understanding will guide further surveys for industrial mineral mining sites on Melos, future excavation of processing sites and potential provenancing of Mediterranean *alumen*.