



Abstract

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Sanctuary, ancient metallurgy, and hyperspectral imaging at Kataliondas *Kourvellos* (Cyprus)

Kataliondas *Kourvellos* is located at the base of an unusual rock knob, in the lower Troodos foothills, about 20 kilometers south of Nicosia. Recent excavations by the University of Geneva revealed that the site was occupied both in the Pre-Pottery Neolithic period, at the end of the 8th millennium BCE, and in the Cypro-Classical period, in the 4th century BCE.

During the Cypro-Classical period, the site functioned as a rural sanctuary. The purpose of having a sanctuary there is not clear: is it because of the rock knob, an obvious landmark? Was the sanctuary placed on the border between the territories of the ancient cities of Tamassos and Idalion? Or was it linked to the mining, smelting, and/or trade of metal resources? The latter seems the most likely choice, on account of the local geological context (lower Troodos foothills). Finding slag (or other traces of smelting activity) at or around Kataliondas *Kourvellos* would at least confirm the link between the sanctuary and ancient metallurgy.

Due to agriculture and human activity in the area, slag and related rocks can be fragmented into many small pieces, distributed across large areas. Under these circumstances, estimating slag distribution is difficult to achieve by manual field sampling. We propose a new approach to estimate slag distribution based on hyperspectral imaging. Having access to the lightest hyperspectral camera system in the world, we fly small unmanned aerial vehicles to cover areas of up to 5 ha. The resulting hyperspectral maps are processed by an algorithm which classifies each pixel as slag or not, depending on its spectral reflectance. Based on this framework, we should be able to estimate the coverage, or surface density, of slag and other traces of smelting activity.