

## **Difficulties obtaining geochemical fingerprints of tuffs associated with early hominin sites, Solo Basin, Java**

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A multidisciplinary team of geologists and anthropologists from the U.S. and Java is examining fossil findsites for early *Homo erectus* in the Solo Basin, central Java, Indonesia. Goals include refining the timing of the first *Homo erectus* presence in the area, determining the nature of the physical environment during the time of habitation, and examining the early eruptive history of the neighboring volcanic complexes. This research has concentrated on identifying geochemical signatures for waterlain tuffs and epiclastic pumice clasts found primarily as 4-8 cm thick interbeds in a series of fluvial sediments.

These signatures present the primary way of correlating six different stratigraphic sections throughout the Basin. Once these correlations have been made, high-resolution  $^{40}\text{Ar}/^{39}\text{Ar}$  analysis of amphiboles could clarify a standing dispute over the age of these hominid fossils. However, alteration and leaching associated with subaqueous deposition of tuffs presents problems in obtaining unambiguous results.

Samples were split into subsets which were either heated above 1050 °C for 5 hours, treated with 5% HCl, or analysed untreated to examine the effect of each procedure on the major and trace element concentrations. Tuffs were found to be intermediate in composition (54-63 wt%  $\text{SiO}_2$ ), and generally subalkaline to alkaline, with tholeiitic affinities. Tuff major element compositions are generally similar to compositions erupted from nearby modern volcanoes, albeit lower in  $\text{Na}_2\text{O}$  and  $\text{K}_2\text{O}$ . Trace element signatures show distinct compositions with little evidence of being genetically related. Strontium strongly follows Ca and its behavior is decoupled from other LIL elements such as Rb, Ba, and La. HFS elements generally behave as a group and concentrations are consistent with indices of differentiation.