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# Archaeometrical Analyses of the Artifacts from Hazar Lake Sunken City in Turkey

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Hazar Lake is a volcanic lake at the foot of Hazarbaba mountain 30 km from Elazig in Eastern Anatolia which has a 7 km width and 22 km of length with the deepest point of 250 m. The Eastern Anatolian fault line passing under the Hazar Lake is still active and has caused many changes in the water level of the lake through the history.
The so called sunken Mid-Age city under the lake which is the focus of our underwater survey is located at the western of the lake between the Kilise island and the main land in the south. On the contrary of the rising water level in the past, the water level has been decreasing during the last years that's why it is possible now to see the top of the two towers in the entrance of the city walls. The all brick construction is unique in its area. Travelers were mentioning of an 11th century monastery in that area. Although there were some 12th-13th century ceramic findings from the small island close to the settlement, the city walls could belong to an earlier date.
The volcanic structure of the area creates the reason for the necessity of complementary archaeometrical analysis including geochemical and petrographical techniques.
After the survey activity in 2006, the collected ceramic artifacts from Hazar Lake sunken city were started to analised. In the analysis, visual examination was first done to classify the artifacts. Ceramic samples were groupped into six in terms of locality, function, clay colour etc. Glaze colours are mainly in green and brown and determined by chromametric analysis. The methods of micro-XRF, PED-XRF and Raman Confokal Spectroscopy were used for the elemental analyses of the ceramics. Analyses showed that the matrix of the ceramics reflect the local formation. The elemental composition of glazes obtained by micro-XRF analysis showed that lead concentrations is more than 80% as PbO. PED-XRF analyses revealed that the presence of copper silicate and iron silicate together produce green color. The firing temperatures of some samples below 800°C or more than 900°C were differentiated by Raman Spectroscopy.