

Man-environment interactions in ancient Sogdiana through isotopic analysis

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Abstract

One of the objectives of the Uzbek-Italian Archaeological Project "Samarkand and its territory" is the investigation of the human-animal relationship in ancient Sogdiana, particularly in the major settlement of Kafir Kala, through isotopic analysis. Strontium ($^{87}\text{Sr}/^{86}\text{Sr}$), oxygen ($\delta^{18}\text{O}$) and carbon ($\delta^{13}\text{C}$) isotopes will be measured on sheep and goat tooth enamel to get information on their mobility and management by humans from pre-Islamic to Islamic occupation. A total of 25 plants and 5 water samples were collected for the Sr baseline 1) around the Kafir Kala site; 2) along the Karatyube piedmont; and 3) Penjikent (Tajikistan). A total of 20 sheep and goat molars were sequentially sampled for isotopic analysis. IR-MS analysis of carbon and oxygen stable isotopes on the carbonate moiety are currently underway to provide information on ovicaprids' altitudinal mobility (i.e. whether they were seasonally moved or lived year-round near the site). This topic will be further investigated through sequential Sr analysis by MC-ICP-MS to possibly confirm the seasonal movement of the animals (e.g. to the mountain area). In addition, oxygen and carbon stable isotopes will provide paleoenvironmental information about this time period (i.e. environmental temperature and seasonality). Overall, through isotopic analysis it will be possible 1) to obtain the first bioavailable Sr baseline from the Middle and Upper Zeravshan Valley; 2) to get information on ovicaprids' mobility and detect any differences in animal management between the pre-Islamic and the Islamic period; and 3) to reconstruct the paleoenvironment of this key region along the Silk Road.