



Geochemical investigation in speleothem reveals groundwater pollution

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Groundwater is the only drinkable water source in Nablus area, Palestine. Geochemical investigations in speleothem sampled from a tunnel in Nablus city area showed an increase in Lead, Arsenic and Rare Earth Element concentrations in the recent 50 years, although the water quality is currently in a good condition. In order to classify the source of the contamination, the lead isotope composition in the speleothem samples was investigated. Several laminations along the growth axis from different speleothem were extracted using Olympus SZ61 New Wave research MicroMill with the smallest bit diameter of 0.5 mm. The lead was chemically separated from the carbonate and lead isotope ratio were measured using MC-ICP-MS at LSCE. The results show that most recent carbonate with higher lead concentration have significantly different lead isotope signature ($^{206}\text{Pb}/^{207}\text{Pb} = 1.177 \pm 0.0001$) compared to older samples and host rock from the region ($^{206}\text{Pb}/^{207}\text{Pb} = 1.19 \pm 0.0001$). We conclude that the cause of lead concentration increase in recent speleothem is anthropogenic and could indicate that urbanization is a risk for the only source of water in the city.