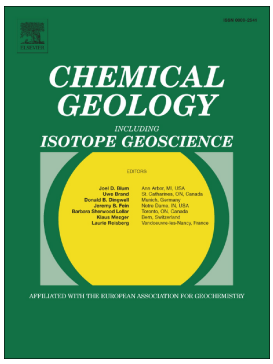

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Geochemical characterization of contemporary fine detritus in the Dead Sea watershed

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Abstract

Reconstruction of paleo-synoptic conditions (e.g. past atmospheric circulation) involves tracing the origins and routes of transport of particles comprising eolian archives (i.e., desert dust). Lacustrine deposits that accumulated in the Quaternary lakes filling the Dead Sea Basin include remobilized eolian desert dust that was washed to the lakes by floods. Here, we analyze the mineralogical, chemical compositions (e.g. Mg/Al ratios) and $^{87}Sr/^{86}Sr$ and $^{143}Nd/^{144}Nd$ (εNd values) isotope ratios of fine siliciclastic particles that form the modern surface cover of the Dead Sea watershed (e.g., loess, mountain soils) and flood particles that are mobilized to the lake during distinct synoptic conditions. The data comprises reference data set that can be used for paleo-synoptic interpretation enhancing our ability to decipher the paleoclimate history during the Quaternary in the Levant. The εNd values and $^{87}Sr/^{86}Sr$ ratios of the fine detritus lie between -8 and -6 and 0.7035 to 0.7188 reflecting the values of erosional products of granitoids that are exposed in the Sahara and Arabia deserts, and (the unradiogenic Sr) from local soils in the Dead Sea watershed. Particles with low Mg/Al ratios (i.e., 0.17-0.31) are transported by the western winds associated with the Mediterranean cyclones, transporting dust from the Sahara, while particles with high Mg/Al ratios (0.27-0.68) are associated with storms blowing dusts from east to the Dead Sea watershed (Saudi Arabia and Syrian deserts) during Red Sea Trough synoptic conditions. Fine particles blown from the Sahara deserts during winter storms, are rapidly