

Facies study and isotope geochemistry of Quaternary tufa and travertine carbonates in the Kurkur-Dungul area (Southern Egypt)

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The presence of travertine and tufa deposits in the driest areas on Earth has high importance in paleoclimate reconstructions. This study focuses mainly on the detailed petrographical and geochemical study of the Quaternary tufa and travertine deposits at Kurkur, Dineigil and Dungul oases, Gebel El-Digm, as well as the calcite deposits at Dungul, Gebel Barq El-Sehab and Gebel Kalabsha (Southern Egypt).

The observed facies associations suggest deposition at ambient temperatures in low-energy flat environments including stagnant ponds, palustrine and/or lacustrine shores, and at the margin of low-energy continental carbonate depositional system in dammed areas, pools and shallow lakes.

Stable and clumped isotopes were used to determine the temperature of the precipitating fluid and the calculated $\delta^{18}\text{O}_{\text{water}}$ values resemble those of the Nubian aquifer in the Western Desert. Strong correlation between the $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ values of tufa samples might be caused by kinetic effects due to strong evaporation. Our results help to reconstruct paleoclimatic and paleoenvironmental conditions prevailed in Southern Egypt during the Quaternary.