

FLUVIAL LIMESTONE TUFFS FROM THE S. PORTUGAL (LOULE-TAVIRA) AND N. MOROCCO (TETUAN): COMPARISON AND ENVIRONMENTAL IMPLICATIONS

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Limestone tuff deposits precipitated in fluvial environments are widespread in the northern Morocco and the S Portugal. These deposits represent environmental conditions prone for the carbonate precipitation mainly in areas of Mesozoic limestone substratum with active water seepage from the aquifers.

The mesoscopic and microscopic characteristics of tuff deposits from Tetouan (Morocco) and Loule and Tavira (Portugal) are very alike; namely on deposit types (e.g. phytoherm barriers; banded limestones with abundant vegetation macro-remains; carbonates precipitation as cement of some early alluvial conglomerates or interbedded alluvial deposits). The common textural features and macro-facies (e.g. banded calcite in regular layers ; moldic porosity; textures resulting from carbonate precipitation mediated by bacteriological activity) point to a similar origin of these limestone tuffs on both sides of Gibraltar Strait despite their slightly different climatic conditions that are influenced by the active inflow of surface Atlantic water towards the Mediterranean (for the Tetouan region) and by the Azores anticyclone (for the Loulé-Tavira region). The field observations show that the limestone tuffs precipitation is nowadays residual and radiocarbon dating of Portuguese deposits points to a chronological framework for their formation starting in the beginning of the post-Younger Dryas climatic recovery and ending around 2.5 ky BP. The oxygen stable isotopes data show a gradual change in the tuffs isotopic signature through the time interval during which the system remained active, without any particular record of climate events such as the 8.2 ka.

The available data and those from monitored modern pluvial characteristics allow the speculation on the parameters controlling the limestone tuffs deposition on both northern and southern sides of the Gibraltar Strait during the Holocene. The carbonate deposition on fluvial systems, such as the studied ones, probably depends on the precipitation / evaporation balance leading to the availability and turbulence of the flowing water along the streams.

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