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## Microbial Carbonate Build-ups in a Presalt Environment, the Afar Rift Lake System

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### SUMMARY

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The Afar area provides a good representation of the facies distribution, the associated geometries, the relations of carbonate travertines with the basaltic/lacustrine basement and a chemical characterization of fluids responsible for the creation of such carbonated objects.

During the last decade, discoveries offshore Brazil have induced a renewal of interest in the study of recent and ancient continental carbonate systems which developed in a wide range of depositional settings, reflecting aerial to subaqueous environments.

Recent and ancient continental carbonate analogs provide some keys to depict the sedimentologic/sequential pattern observed at the core scale and help in the understanding of the impact of climate change, fluid flow and water chemistry on the carbonate factory. Thus, to complete the study of the ancient South Atlantic travertine systems, a focus is carried out on its Quaternary analog in the Afar Rift area (Djibouti).

The junction of three magmatically active rifts, the Main Ethiopian Rift, the Red Sea and the Gulf of Aden, characterizes the Afar area. This rift-in-rift system is responsible for the wide volcanic basement and the particular topography, upon which are setting several perched lakes. On the East, the Abhé Lake constitutes the topographically higher lake, which is hydrologically linked to the western and lower part of the system, the Ghoubbat al Kharad gulf. According to the climate, the hydrological circulations change controlling thus the base level and the salinity of the lakes. Accordingly, during high stages, carbonates are deposited, they mainly consist of coquinas and algal/microbial build-ups, and during low stages (also the drier ones), evaporites take place in the depocenter of the lakes.

The carbonate build-ups and their relation with the volcanic basement and the salt hold the key for the stratigraphical and chemical interpretation of the ancient system.

We present here the preliminary results of the project. The stratigraphical relations of the algal/microbial carbonate build-ups with the basement and/or lacustrine deposits are described and compared to ancient systems.

A facies classification is proposed and concerned a) the algal/microbial carbonate mound, b) the lacustrine deposits.

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