

UNRAVELING THE GENESIS OF THE MESSINIAN SALT GIANT

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Context

During the uppermost Miocene time, known as the Messinian, from ca. 5.9 to 5.33 Ma ago, the entire Mediterranean region was interested by a ca 1000-1500 m relative sea-level fall which triggered important erosional processes and sediment remobilization at the basin margins and in certain area the deposition of a very thick layer of evaporites. The large presence of the latter gave the name to this specific time interval also known as Messinian Salinity Crisis (MSC). Hundreds meters of evaporites (salt and gypsum) have been observed at the centre of the basins from the Levantine to the Western Mediterranean close to the Balearic islands. Despite the widespread occurrence every little information exist regarding their composition and chemistry and especially their environmental and paleoclimatic significance. Two contrasting theories in fact exists which generated a long-lasting strong debate within the scientific community: were these evaporites deposited in near-subaerial environment or rather in a deep, subaqueous and supersaturated environment ?

Objectives and Methods

The objective of this MSc research are to establish a unique detailed sedimentological and compositional study of the evaporites succession from one of the most well-known Messinian salt-mine existing in Sicily and try to contribute to shed some light on the origin of the salt. The succession preserved on a continuous core which will be accurately examined and sampled to perform mineralogical and geochemical analysis investigating the significance of the inorganic and organic composition of various layers of different composition (dark and light intercalations). The research will include field work In Italy (Sicily) and visit to the core repository of the University of Milan (Italy).

Literature

Lofi, J., Sage, F., Deverchere, J., Loncke, L., Maillard, A., Gaullier, V., Thion, I., Gillet, H., Guennoc, P., Gorini, C., 2011. Refining our knowledge of the Messinian salinity crisis records in the offshore domain through multi-site seismic analysis. *La Soc. Geol. Fr.* 182, 163–180.
Roveri M. and Manzi V. 2006 The Messinian salinity crisis: Looking for a new paradigm? *Palaeogeography, Palaeoclimatology, Palaeoecology* 238, 386–398



WEB sites

<http://unige.ch/ge-rgba>
<https://www.saltgiant-etn.com/>
<https://medsalt.eu/>

This MSC research project is part of two large European networks MedSalt and SaltGiant. The successful candidate will be therefore given the opportunity to attend seminars and conferences, possibly field trips organised in the context of this European Research project.

Choice of orientation :

1) Sedimentary, Environmental and Reservoir Geology