



Land to sea record of the mega-eustatic cycle including the Messinian Salinity Crisis in the Mediterranean Andalusia

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The outstanding event of the Messinian Salinity Crisis is very well documented in the onshore Sorbas and Vera Andalusian basins where its process and chronology are now well-known (Gautier et al., 1994, Krijgsman et al., 1999; Clauzon et al., 2009).

The detailed study of these basins was at the origin of the two-step scenario of the Messinian salinity crisis (Clauzon et al., 1996) which clarified several aspects of the “deep desiccated basin” model of Hsü et al. (1973). The scenario in two steps (first step: evaporite deposition in Mediterranean marginal basins between 5.96 and 5.60 Ma; second step: evaporites deposition between 5.60 and 5.46 Ma in the almost dried up Mediterranean central basins, and subaerial erosion and deep canyons formation on the margins; Clauzon et al., 1996, 2005, 2008) has now the broadest consensus within the scientific community (CIESM, 2008).

The Sorbas and Vera basins present all the markers in terms of sequence stratigraphy whatever these events were caused by moderate or excessive sea-level changes:

- 1, coral reefs, showing the relative sea level before the crisis;
- 2, gypsum (120 m in thickness) deposited during the first sea level drop (about 150 m) between 5.96 and 5.60 Ma;
- 3, the widespread erosion surface during the maximum sea level fall (ca. -1500 m);
- 4, the re-flooding at 5.46 Ma

These onshore markers have also been recorded in offshore seismic profiles, allowing a continuous mapping of the Messinian canyons from land to sea.

These onshore and offshore areas (Mauffret et al., 2007; Ammar et al., 2008) have also undergone a tectonics according to their proximity to the Betic cordillera (the south of the Sorbas Basin was more affected for example). Stratigraphic markers of the messinian crisis are powerful tools to reconstruct the tectonic events since 5 Ma.

This work has made possible the calibration of tectonic deformations on south Andalusia present-day onshore and offshore domains.

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