

Theme 18. The signature of Messinian Salinity Crisis in the North Africa

The Messinian Salinity Crisis and “Lago Mare” events in Mediterranean marginal and central basins

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During the Middle - Late Miocene, the Mediterranean evolved as a normal marine basin due to its continuous connection with the Atlantic Ocean. Some imprints of connection between the Mediterranean and Paratethys are recorded in marginal basins according to the presence of the freshwater and marine mixed faunal assemblages, characterizing the so-called “Messinian Lago Mare biofacies”, particularly just before the major sea-level drop at 5.60 Ma in the Mediterranean.

Between 5.60 and 5.33 Ma, one of the most spectacular environmental crisis of the Neogene period occurred in Mediterranean Basin: the Messinian Salinity Crisis (MSC). During the MSC, the Mediterranean Sea was transformed into a giant saline basin, one of the largest in the Earth’s history. This dramatic event is illustrated by the deposition of thick evaporites in the central Mediterranean basins interrupting the previous normal-marine sedimentation, and by coeval outstanding fluvial erosion which affected the margins.

The reflooding of the Mediterranean Basin by Atlantic waters at the beginning of the Pliocene allowed the reestablishment of the previously existing connections with the Paratethys generating the widely recorded “Early Pliocene Lago Mare biofacies”.

These “Lago Mare biofacies”, respectively Messinian (ante-MSC) and Zanclean in age, are caused by Mediterranean high sea-level phases allowing water exchanges between the Mediterranean and Paratethys. They are both recorded on the Mediterranean margins with mirror deposits in the Eastern Paratethys region (Dacic Basin, Black Sea).

Another “Lago Mare biofacies” is usually recorded in the deep almost completely desiccated Mediterranean central basins where it represents the latest Messinian deposit, sandwiched between the uppermost evaporites and the lowermost Zanclean clays. Its significance is still unclear and new researches are necessary to precise its (brackish or hypersaline?) shallowwater conditions of sedimentation.