



Lago-Mare deposits of the Nijar Basin: repeated opening and closure of the Mediterranean-Atlantic connection during the latest Messinian

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One of the major problems concerning the Messinian salinity crisis is what kind of watermasses filled the Mediterranean basins after the widespread evaporite deposition and before flooding by normal marine waters at the beginning of the Pliocene. In many basins chalky and marly sediments were formed showing a characteristic 'Lago-Mare' biofacies type (as defined by Ruggieri, 1967 and Hsü et al., 1978). The Nijar Basin provides a well preserved stratal record covering this time span (for details see Fortuin and Krijgsman, 2003). Before and after the salinity crisis open marine sediments were formed in this basin. The strontium isotopic composition of well preserved ostracods is a powerful tool to distinguish full marine conditions from restricted continental dominated environments (McCulloch and DeDecker, 1989). We sampled investigated assemblages of the well known Lago-Mare ostracod *Cyprideis pannonica* from various levels.

The upper Messinian record of the Nijar Basin typically shows a cyclic alternation of often laminitic Lago-Mare sediments and continental intervals. We both investigated ostracod assemblages from the basal marls flooding the continental intervals and from higher levels in the L-M intervals. Our data indicate that the basal ostracods from the lowermost L-M intervals have a marine isotopic imprint (both for $^{87}\text{Sr}/^{86}\text{Sr}$ as well as $\delta^{18}\text{O}$ composition). Higher up the ostracods show a mixed signal, with lower Sr isotopic ratios and a higher $\delta^{18}\text{O}$. The latter values indicate a higher degree of

evaporation. The lower $^{87}\text{Sr}/^{86}\text{Sr}$ values agree with reference samples from Cyprus (kindly provided by J.M. Rouchy) from comparable stratigraphic levels. The values, however, differ from the isotopic composition of samples from the Lago-Mare marls of the Cuevas de Almanzora section of the Vera Basin (Fortuin et al., 1995). Values from the first Lago-Mare bed in the Sorbas Basin (Zorreras Formation) are significantly more radiogenic than those of the Nijar Basin.

Major implications of this study are:

The Lago-Mare of the Nijar succession initially still has a marine signature, which points to marine connections between the Mediterranean and the Atlantic. Upwards, however, the basin became more restricted reflecting a stronger continental input during which Atlantic connections were closed off. Similarity of the less radiogenic values with the Cyprus samples suggest that these ostracods lived in inter-connected water masses. The discrepancy between the Nijar and Sorbas samples can be explained by strong local run off from the surrounding mountain ranges of the then strongly enclosed Sorbas Basin.

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