

The Lorca basin revisited: how integrated stratigraphy can help resolve long-standing controversies

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Evaporitic deposition was widespread and voluminous during the Upper Miocene in the Mediterranean basin. These deposits can be correlated regionally to marginal basins with strikingly similar depositional ages. However, the age of the Upper Miocene sediments of the Lorca basin in southern Spain remains controversial; the pre-evaporitic and evaporitic deposits have been variously assigned to the Tortonian and the Messinian.

We performed an integrated study of the Varied Member of the Serrata Formation in the La Serrata section, based on sedimentology, micropaleontology of calcareous plankton, magnetostratigraphy, and radiochronology. Preliminary data indicate that the succession was deposited during the Messinian on the basis of the calcareous nannofossil and foraminifera assemblages.

The finding of *Reticulofenestra rotaria* from the base of the Varied Member indicates an age not greater than 7.4 Ma. The first consistent appearance in the middle part of the section of *Turborotalita multiloba* (an endemic Messinian foraminifer taxon) concurrently with *Neogloboquadrina acostaensis* (sinistral coiling) in an interval with reverse magnetic polarity, suggests a correlation with UA15-17 cycles identified by Sierro et al. (2001) in the Perales section (Sorbas basin, Spain). Two dispersed tephra layers identified at the base of the section contain volcanic glass and a mineral assemblage suitable for $^{40}\text{Ar}/^{39}\text{Ar}$ dating. These layers occur just below the occurrence of *Turborotalita multiloba* and the $^{40}\text{Ar}/^{39}\text{Ar}$ dating of these tuffs is underway to test this age interpretation.

The available data permit reconstruction of the characteristics of the water column immediately before the deposition of the gypsum of the Messinian Salinity Crisis. The environment was evidently eutrophic, as also suggested by a great abundance of diatoms.