

Strontium-Isotope Stratigraphy and Ammonoid Biostratigraphy of the Late Barremian-Early Albian Succession from the Maestrat Basin (E. Iberia)

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Abstract

Based on numerical ages derived from $^{87}\text{Sr}/^{86}\text{Sr}$ values measured on shells of oysters, brachiopods and rudists, as well as on a new ammonoid findings, the chronostratigraphy of the Late Barremian-Early Albian sedimentary succession (around 1.9 km thick) of the Maestrat Basin (E Iberian Peninsula) is reviewed. The marine Artoles Formation, which is the oldest lithostratigraphic unit analyzed, is Early to Late Barremian. The dinosaur-bearing Morella Formation and its transitional to marine equivalent, the Cervera del Maestrat Formation, are Late Barremian in age and at least include part of the *Imerites giraudi* ammonoid zone. The numerical ages obtained for the overlying marine Xert Formation are in accordance with a latest Barremian-basal Aptian age. An ammonite belonging to the Late Barremian *Martelites sarasini* Zone was recently found by the present authors at the lowermost part of this latter formation. The succeeding marls of the Forcall Formation and the platform carbonates of the Villarroya de los Pinares Formation are of Early Aptian age. The marine Benassal Formation, the last lithostratigraphic unit sampled, spans the terminal Early Aptian-Late Aptian interval. The lower part of the overlying coastal to continental coal-bearing Escucha Formation is Early Albian because of ammonite occurrences in the depocentre of the basin. The Barremian-Aptian boundary in the Maestrat Basin is located within the stratigraphic interval comprised between the uppermost part of the Xert Formation and the lowermost part of the Forcall Formation. More precisely, the limit between the Barremian and the Aptian is tentatively placed close above the base of the transgressive marls of the Forcall Formation by analogy with the close-by Vocontian, Organyà and Basque-Cantabrian basins, which contain latest Barremian ammonites in the basal part of marly units deposited during a major transgressive event. Hence, in the Maestrat Basin, the pass from the Barremian into the Aptian was characterized by a Tethyan-wide transgression, which drowned the Late Barremian-basal Aptian(?) carbonate platforms of the Xert Formation prior to the Early Aptian oceanic anoxic event (OAE1a). Extensive carbonate platforms belonging to the Villarroya de los Pinares Formation developed during a post-OAE1a late Early Aptian major regression. The improved chronostratigraphic framework obtained allows a more precise correlation with other coeval successions worldwide.