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From peritidal to open marine, from carbonates to siliciclastics: different expression of sedimentary cycles (Tithonian, NE Spain)

J. Ipas, B. Bádenas, M. Aurell

Ciencias de la Tierra-Universidad de Zaragoza, Zaragoza, Spain (ipas@unizar.es)

At the end of the Jurassic, the marginal areas of the epeiric platform developed in the northeastern Iberian Plate record a large variety of facies, ranging from carbonate or siliciclastic-dominated peritidal successions to open marine carbonates with variable clastic influence. A common feature in these facies is their arrangement in cycles of different order. The Tithonian of the Iberian Basin consists of two second-order sequences. These are formed by eight third-order sequences that can be traced all around the basin. Third-order sequences are composed by a variable number of meter-scale parasequences or high-frequency cycles.

Three outcrops representing different locations in the Iberian Basin were selected for detailed logging and comparison. A section located in the open basin area (Montanejos section) is 450 m thick and consists of 57 parasequences with variable facies, including a significant number of subtidal cycles. The Las Parras de Castellote section is 240 m thick and includes a similar number of parasequences (59 cycles). Many of them consist of classical peritidal carbonate cycles, with algal laminated caps. The Galve section (160 m thick), located in the mixed carbonated-siliciclastic domain, has abundant sandstone levels. The characterization of parasequences is only possible at certain parts of the Galve succession, in which episodic flooding of these marginal areas resulted in a larger proportion of marine influenced carbonates.

The two successions dominated by carbonates were able to record the high-frequency signal, giving rise to parasequences. The number of parasequences defined in these two successions is quite similar suggesting the influence of sea-level changes in the Milankovitch frequency band (i.e., the 100 kyr cycle). The scarce record of this cyclicity in the Galve succession is explained by the high siliciclastic input. Third-order

sequences seem to be recorded in all the sections. However, aspects such as overall thickness and sedimentary evolution were controlled by the local subsidence history.