Orbital chronology of the Barremian Stage from the Eastern Subbetic (Spain)

Aguado, R.[1], Company, M.[2], Martinez, M.[3], Martínez-López, F.J.[4], O'Dogherty, L.[4,*], Sánchez-Bellón, Á.[4], Sandoval, J.[2]

1) Dpto. Geología, EPS-Linares, Universidad de Jaén, Linares, Spain
2) Dpto. Estratigrafía y Paleontología, Universidad de Granada, Granada, Spain
3) MARUM, Bremen, Germany
*4) Dpto. Ciencias de la Tierra, Universidad de Cádiz, Puerto Real, Spain, *E-mail: luis.odogherty@uca.es*

The basic purpose of this contribution is to estimate the accurate time span of the Barremian stage. To reach such objective we propose in this study the combination of basic chronostratigraphic tools (chemo-, magneto- and biostratigraphic) in an astronomical-calibrated framework through cyclostratigraphic approach in two pelagic sections from the Subbetic basin (SE Spain). Because Earth's climate is affected by cyclic modifications of its orbit, consequently the sedimentary record reflects a true and continuous evolution of palaeoclimatic proxies. The identification of Milankovitch cycles, deduced by means of magnetic susceptibility, calcium $CaCO_3$ and clay mineralogy, will provide the basis for a precise age-model of the Barremian stage.

In this sense, two pelagic successions from the Subbetic basin (Valentín, $X.V_1$: 74.80 m thick, and Barranco de Cavila, $X.Kv_2$: 67.70 m thick), well dated by ammonites, and encompassing the uppermost Hauterivian to lowermost Aptian interval were sampled for high-resolution stratigraphic studies. These will include magnetic susceptibility, carbon and oxygen isotope stratigraphy and clay mineralogy. The sampling interval was constant and as tight as 7 cm along the two sections, with a total of 2,027 samples (1,073 in $X.V_1$ and 954 in $X.Kv_2$) along the complete interval studied. Taking advantage of this high-resolution sampling, the first (FOs) and last occurrences (LOs) of several calcareous nannofossil markers, and calcareous nannofossil zonal boundaries along the study interval, were determined with a high precision. These include the LOs of *Lithraphidites bollii*, *Micrantholithus spinulentus*, and *Calcicalathina oblongata* and the FOs of *Flabellites oblongus*, *Lithraphidites houghtonii*, *Micrantholithus stellatus* and *Hayesites irregularis*. The boundaries between subzones NC5B/NC5C, NC5C/NC5D, NC5D/NC5E and zones NC5/NC6 were determined with precision. In addition, the uppermost Barremian event, known as 'nannoconid decline' or 'first nannoconid crisis' was recorded, and correlated with precision with respect to ammonite biostratigraphy (AGUADO et al., 2014).

AGUADO, R. et al., 2014. Cret. Res., **49**, 105–124.