



The Bartonian-Priabonian marine record of the Eastern South Pyrenean Foreland Basin (NE Spain): A new calibration of the larger foraminifers and calcareous nannofossil biozonations.

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The up to 5000-m-thick sedimentary infill of the South Pyrenean Foreland Basin (in NE Spain) records the Cenozoic evolution of the NE Iberian plate. This region is an excellent area where to perform a combined biomagnetostratigraphic study of a Paleogene succession as the present level of erosion of the basin infill and its surrounding mountain ranges is at an optimal stage for studying a continuous and thick stratigraphic record. In this sense, a biochronological framework of the South Pyrenean Foreland Basin has been developed since the early 1950's, which was later combined with magnetostratigraphic studies. This biochronological framework, together with all the available literature on the biostratigraphy and magnetostratigraphy of the Paleocene and Eocene Tethys, were integrated in a general chronostratigraphic framework used to define and calibrate the larger foraminifer biozonation (Shallow Benthic Zones, SBZ). However, in the Geological Time Scale 2004 no correlation of the Paleogene SBZ zonation with the geomagnetic polarity time scale was provided.

Here we present a combined biostratigraphic (larger foraminifers, calcareous nannofossils) and magnetostratigraphic study of the Middle and Late Eocene marine units of the Igualada area, on the eastern Ebro Basin. The studied sections of Santa Maria de Miralles and La Tossa encompass the complete marine succession of the Santa Maria Group. A total of 224 paleomagnetic sites and 64 biostratigraphic samples were collected along a 1350-m-thick section that ranges from chron C20n to chron C16n (ca. 43-36 Ma). The resulting magnetostratigraphy-based chronology challenges existing chronostratigraphic interpretations of these units and results in a new calibration of the larger foraminifers and calcareous nannofossil biozonations. The traditional division of the Bartonian stage into two complete larger foraminifers zones, SBZ17 and SBZ18, is challenged. Zone SBZ17 embraces most of the Bartonian, while Zone SBZ18 extends from late Bartonian to early Priabonian. In addition, a new Subzone (SBZ18b = *N. variolarius/incrassatus* Biozone), recognized in both the Ebro Basin and the Priabonian type sections of Italy, is proposed, while the Subzone SBZ18a is equivalent to the former Zone SBZ18. Magnetostratigraphic calibration of calcareous nannofossil in the Ebro Basin reveals a mismatch with the current calibration of Zone NP19-20, suggesting that First Occurrence of *Isthmolithus recurvus* is a diachronic event, of low reliability for long-distance correlations. The calcareous nannofossil Zone NP19-20 correlates to the larger foraminifers Zone SBZ18 (uppermost Bartonian-early Priabonian).