

Nannofossil and environmental changes across the Sinemurian/Pliensbachian boundary in the Lusitanian Basin (S. Pedro de Moel, Portugal)

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The Sinemurian/Pliensbachian boundary is characterized by an important event in the history of coccolith diversification, namely the first occurrence of *Similiscutum* (placolith coccoliths). However, nannofossil assemblages from this time interval are still poorly studied. In this work, an integrated study of calcareous nannofossils (absolute and relative abundance), inorganic (carbon and oxygen isotopes) and organic geochemistry (biomarkers) is presented. Nannofossil preservation is moderate to good in the studied samples. Delicate structures, such as the long spine of *Parhabdolithus liasicus liasicus*, are commonly preserved. Some bio-events are reported from San Pedro de Moel. The first occurrences of *Mitrolithus lenticularis* and *Crepidolithus crassus* are recorded in the Late Sinemurian, respectively ~20 and ~15 m below the Sinemurian/Pliensbachian boundary, as defined by ammonites. The first occurrence of *Similiscutum* is observed ~3 meters above the Sinemurian/Pliensbachian boundary. Few specimens of *Mazaganella* are recorded from the base of the section.

Sedimentological data indicate a sea-level drop close to the Sinemurian/Pliensbachian boundary at the studied site. Nannofossil abundances per gram of rock are the lowest during the sea-level low, probably because of the reduction of the ecospace for the development of a well-diversified nannoplankton community. Although *Schizosphaerella* spp. (a probable calcareous dinoflagellate) is always dominant in the analysed samples, coccolith proportion progressively increases in the basal Pliensbachian. The percentage of *Parhabdolithus liasicus liasicus* and *P. liasicus distinctus* that are very common in the assemblage seem to be inversely correlated. Average relative abundance of *Mitrolithus jansae* is 10% in the Upper Sinemurian samples, but increases up to 30% in the Lower Pliensbachian. Our results are similar to those presented for the same section by N. Perilli in Duarte *et al.* (2006), although this work only deals with qualitative nannofossil data.

Environmental conditions favorable to organic matter (OM) accumulation occurred in the Late Sinemurian (*Rari-costatum* Zone), but OM-poor sediments are recorded in the Early Pliensbachian. The changes observed in the nannofossil assemblage composition may be the response of the nannoplankton community to environmental changes occurring across the Sinemurian/Pliensbachian. However, because of the scarcity of works dealing with ecological preferences of Lower Jurassic nannofossil taxa, we are at present unable to interpret them. The comparison of nannofossil assemblage composition and data derived from inorganic and organic geochemistry should enable us to

better understand the ecology of some of the most ancient coccolithophorids.

Reference

Duarte, L.V., Perilli, N., Antonioli, L., Rodrigues, R., Cabral, M.C., Dino, R. & Azerêdo, M.C. 2006. Evidências sedimentológicas, geoquímicas (COT) e micropaleontológicas nas facies bituminosas do Sinemuriano termianl de Agua de Madeiros (Portugal). *VII Congresso Nacional de geologia, 2006, Universidade de Evora*: 633-636.