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Benthic foraminiferal biostratigraphy of the Aalenian–Bajocian (Middle Jurassic) boundary in the Barranco de Agua Larga section (Betic Cordillera, southern Spain)

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This work describes the benthic foraminiferal assemblages recorded across the Aalenian – Bajocian boundary in the Barranco de Agua Larga section (Betic Cordillera, SE of Spain), where the ammonite record has enabled the recognition of the Gigantea Subzone in the Bradfordensis Zone (Middle Aalenian), the Concavum and Limitatum subzones in the Concavum Zone (Upper Aalenian) and the Discites Zone (Lower Bajocian). This reference section is characterized by an alternation of limestones and marly limestones corresponding to distal marine environmental conditions, where a total of 17 samples have been collected. They have provided abundant and diverse foraminiferal assemblages, constituted by well-preserved specimens displaying close similarities to those already described for the Jurassic carbonate platforms of the Boreal Realm. From the study of the samples, a total of 3139 specimens have been obtained, corresponding to 5 suborders, 11 families, 25 genus and 80 species.
The representatives of the Suborder Lagenina are the most abundant, Vaginulinidae is the most abundant family and Lenticulina is the most abundant genus. From a specific level, the most abundant species are Thurammina jurensis (Franke), Lenticulina muensteri (Roemer) and Prodentalina pseudocommunis (Franke).
The occurrence of Astacolus dorbignyi (Roemer) in the Gigantea Subzone has enabled the recognition of the Astacolus dorbignyi Zone. The first occurrence of Lenticulina quenstedti (Gümbel) in the Concavum Subzone has allowed the recognition of the Lenticulina quenstedti Zone. In Barranco de Agua Larga section this species co-occur with Ramulina spandeli Paalzow, the index fossil used in the establishment of the Ramulina spandeli Zone. This zone was defined in the lower part of the Discites Zone in the Murtinheira section (the Bajocian GSSP) and related to distal platform conditions. In the Iberian Basin the Ramulina spandeli Zone was recognized in the Hontoria del Pinar section, but not in the Talveila section, both related to proximal positions within the platform. Ramulina spandeli Paalzow occurs in the studied section since the upper part of the Gigantea Subzone, displaying a much wider range than in the Lusitanian and in the Iberian basins, where it occurs in the Lower Bajocian. Other bioevents of biostratigraphic relevance have been identified throughout the studied interval: an increase in abundance and diversity of the assemblages' composition in the upper part of the Gigantea Subzone; and a decrease in abundance and diversity of the assemblages' composition recognized in the uppermost part of the Limitatum Subzone, also recognized in coeval sections from other Iberian basins.