



***MOHLERINA BASILIENSIS* (BENTHIC FORAMINIFER) AND *BACINELLA-LITHOCODIUM* ONCOIDS: PALAEOENVIRONMENTAL AND PALAEOECOLOGICAL IMPLICATIONS (LATE OXFORDIAN, SWISS JURA)**

S. Védrine and S. Spezzaferri

(1) University of Fribourg, Department of Geosciences, Geology and Paleontology, Ch. du Musée 6, 1700 Fribourg, Switzerland, e-mail: stephanie.vedrine@unifr.ch.

Mohlerina basiliensis (Mohler) is a benthic foraminifer with a double-layered wall (thick outer hyaline radial-fibrous calcite layer and thin inner microgranular layer) found from the internal platform down to the slope and preferentially in low-energy facies. Its stratigraphic range is from the Middle-Late Bathonian to the Valanginian. The taxonomy of *Mohlerina basiliensis* is still in debate; Septfontaine (1981) called it “Mesozoic Fusulinina” based on the characteristic double-layered wall.

In the oncoïd-rich Hauptmumienbank Member deposits (Late Oxfordian) from the Swiss Jura platform, *Mohlerina basiliensis* commonly occurs. Here, we present a high-resolution study (20-kyr time resolution) of these lagoonal deposits based on four sections, which record the beginning of a 2nd order transgression (Bimammatum zone). For each section, elementary, small-scale, and medium-scale depositional sequences have been identified independently, based on field observations, sedimentary structures, microfacies, texture, and faunal content. These sequences are interpreted as being related to insolation changes controlled by the orbital cycles (20 kyr for elementary, 100 kyr for small-scale, and 400 kyr for medium-scale sequences). This sequence and cyclostratigraphic analysis thus provides a narrow time framework for palaeoenvironmental and palaeoecological studies.

The absolute abundance of *M. basiliensis* was estimated by counting specimens per thin section. The *M. basiliensis* distribution is relatively patchy. The distal platform

facies present a higher abundance and a more extensive stratigraphic occurrence of this foraminifer. The first occurrence of the *M. basiliensis* differs between sections in time and space but follows a proximal-distal evolution. In the most distal section (Pertuis), the first occurrence is coeval with the beginning of the 2nd-order marine transgression. In the other sections, the first occurrence is observed successively later. This suggests the stepwise flooding of the platform during the transgression.

In all sections, *Mohlerina basiliensis* always occurs with *Bacinella-Lithocodium* oncoids but not vice-versa. In the Hauptmumienbank Member, two groups of oncoids are defined from thin section: micritic-dominated and microbial-dominated oncoids. Micrite-dominated oncoids are small (a few mm to 1 cm) with a smooth surface; they have a micritic cortex with regular or irregular laminations and are associated to low- and high-energy facies in protected and semi-open lagoons. Microbial-dominated oncoids are larger (a few mm to 5 cm) with a lobate surface and a cortex composed mainly of the microencrusters *Bacinella irregularis* (Radoicic) and *Lithocodium aggregatum* (Elliot). They are associated to low-energy facies in open lagoons. The *Bacinella-Lithocodium* association characterizes lagoonal environments with oligotrophic conditions, low sediment accumulation rate, and clear, oxygenated, shallow, normal-marine waters (Dupraz & Strasser 1999). The distribution of *Bacinella-Lithocodium* oncoids through time and space is patchy; however, they appear more abundantly in distal platform facies. The distribution of the oncoid types shows a clear correlation with sequence stratigraphy and thus with relative sea-level fluctuations. Micrite-dominated oncoids are preferentially found around 100-kyr and 20-kyr sequence boundaries and in transgressive deposits while *Bacinella-Lithocodium* oncoids occur around 100-kyr and 20-kyr maximum floodings and in highstand deposits.

The co-occurrence of *Mohlerina basiliensis* and *Bacinella-Lithocodium* oncoids suggests that the ecological conditions preferred by *Mohlerina basiliensis* were similar to those of *Bacinella-Lithocodium* microencrusters.

References

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