



## **Abundance and size changes in the calcareous nannofossil *Schizosphaerella* – relation to sea-level and palaeoenvironmental change across the Sinemurian to earliest Toarcian of the Paris Basin**

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The nannolith *Schizosphaerella* spp. was predominant in Early Jurassic calcareous nannofossil assemblages. Previous studies have shown a significant drop in abundance and mean size of *Schizosphaerella* during the early Toarcian Oceanic Anoxic Event which has been interpreted by some authors either as a calcification crisis due to increased pCO<sub>2</sub>, or as a response to increased nutrient availability, and/or greenhouse warming.

Abundance and size changes in *Schizosphaerella* have here been thoroughly investigated throughout the upper Sinemurian to lowermost Toarcian (Early Jurassic) of the Sancerre-Couy core (Paris Basin) based on 116 samples. Our results show a stepwise rise in abundance of *Schizosphaerella* in the lower part of the investigated section and a rise in abundance of coccoliths during the major transgression of the Sinemurian, confirming that *Schizosphaerella* was better adapted to proximal areas than coccoliths. Mixture analysis of the biometric measurements show the existence of three populations of *Schizosphaerella*, interpreted as different morphotypes with different ecological affinities. Proximal, cool environmental conditions of the upper Sinemurian are associated with a dominance of the large population of *Schizosphaerella*. A dominance of the medium population, corresponds to cool surface waters and more distal conditions. Warm episodes are systematically linked to a dominance of the small population. Therefore we propose that the size response of *Schizosphaerella* throughout the Early Jurassic was rather a change in abundance of different ecophenotypes or (sub-) species of *Schizosphaerella*, with distinct affinities to temperature and proximal/distal environmental conditions.