

# Abundance and size changes in *Schizosphaerella* – relation to climatic and paleoenvironmental change across the Early Jurassic in the Paris Basin

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Abundance and size changes in the calcareous nannofossil genus *Schizosphaerella* were investigated during the Early Jurassic (late Sinemurian to early Toarcian) of the Sancerre-Couy core (Paris Basin). Measurements were compared to variations in CaCO<sub>3</sub> content, total organic carbon (TOC) content, and isotopic trends in carbon and oxygen. Our results confirm that *Schizosphaerella* was better adapted to proximal areas than coccoliths, as expressed by the stepwise rise in abundance of *Schizosphaerella* that was followed by a rise in abundance of coccoliths during the major transgression of the Sinemurian. The results show that changes in the size of *Schizosphaerella* were primarily a response to Early Jurassic temperature variations (icehouse and coolhouse versus greenhouse conditions). Large average sizes of *Schizosphaerella* corresponded mainly to the proximal, cool environmental conditions of

the upper Sinemurian. Medium average sizes corresponded to more distal conditions and cool surface waters, whereas small average sizes were associated with warm episodes. Biometry statistics also suggest the presence of three main morphotypes and the possibility of an additional fourth morphotype with relatively minor contributions. Changes in the average size of *Schizosphaerella* thus appear to be controlled by changes in the relative abundance of these morphotypes that likely had distinct environmental preferences. These results suggest that *Schizosphaerella* size variations at the Toarcian oceanic anoxic event and preceding environmental perturbations of the Early Jurassic were probably not a physiological response to lower calcification but rather represent changes in abundances of the different ecophenotypes or (sub-) species in response to climate change.