



Morphological flexibility of *Cocconeis* sp. nanostructure along a natural salinity gradient

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Diatoms possess a silica frustule decorated with unique patterns of nano-size features. Here, we show for the first time from in situ samples, that the size of the nano-pores present at the surface of a diatom species varies with fluctuating salinity levels. The reduction of the nanopores size with decreasing salinity is in accordance with previous laboratory experiments. In particular, our results suggest that diatoms compensate the decrease in diffuse layer by modifying their pore size in order to maintain an equal diffusion capacity at any salinity. By doing such, diatoms guarantee that they will always be able to absorb the same amount of nutrients whatever the salinity. These results suggest that the overall ecological success of diatoms, and their ability to react to environmental changes, may be associated with their capacity to modify the morphological characteristics of their frustules.