



Assessing environmental control on dinoflagellate cyst distribution in surface sediments of the Benguela upwelling region (eastern South Atlantic)

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ABSTRACT: Organic-walled dinoflagellate cyst assemblages in surface sediments of the Benguela Current Upwelling System (eastern South Atlantic) show geographic patterns that cannot entirely originate from cyst production or transport. Aimed at answering how far these variations are due to taphonomic control, this study investigated a possible correlation with the changes in bottom-water oxygen concentrations typifying this region. Based on 36 samples, multivariate statistics were used to analyze community variability with respect to bottom-water oxygen concentration, temperature, salinity, nutrient content, chlorophyll *a* (Chl *a*) concentration, the organic carbon content of surface sediments, and a measure of water column stratification. Determined relationships to salinity, nutrient supply, nutrition, and environmental steadiness point out the requirements for dinoflagellate cyst production, while cross-shelf transport processes could have introduced variability prior to burial of cysts in surface sediments. The offshore decrease in the relative abundance of protoperidinaean cyst types was consistent with their lower preservation potential under oxygenated conditions and coincided with a change in assemblage composition toward oxidation resistant species. On elimination of covariation, bottom-water oxygenation was significantly related to this pattern and determined together with seasonal salinity, Chl *a*, and annual phosphate concentration, the parameter combination best explaining community variability. These results suggest that postdepositional degradation of peridinioid dinoflagellate cysts would partly explain the onshore-offshore gradient in species distributions and could be responsible for more variability in assemblage compositions than is presently acknowledged.

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