Sedimentary organic matter in the Admiralty Bay (King George Island, Antarctic Peninsula).

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The characterization of links between the diversity of benthic fauna, sediment bioturbation processes, and biogeochemical fluxes at the sediment-water interface is essential to better understand the consequences of a change in benthic biodiversity resulting from global changes on the ecological and biogeochemical functioning of Antarctic coastal ecosystems. The first part of this approach was aimed at assessing the spatial variability of the main features of sedimentary OM and its lability. Organic carbon and total nitrogen, total and enzymatically hydrolysable amino acids, chloropigments (and their degradation products), mean grain size and $\delta^{13}C_{OC}$ were measured in the top sediment layer of sediments cores collected during the 2012 austral summer at 53 stations located within the three inlets of Admiralty Bay (King George Island, South Shetland Islands, Antarctic Peninsula). Results clearly show an important spatial variability of OM descriptors throughout the Admiralty Bay. Based on the main features of sedimentary organics, the inlets are significantly different. Organic C contents were quite low in the different inlets of Admiralty Bay as observed in other Antarctic areas although the highest contents were measured in areas enriched in macroalgae and close to the Brazilian Scientific Station. Total N had a similar pattern with levels 3-fold higher close to the Brazilian Station. Sediments consisted mainly of silty muds but fine sands have also been found in some areas in the vicinity of glaciers or at the entrance of inlets. However, the differences in OM descriptors cannot be only explained by sediment grain size. The C/N ratios and $\delta^{13}C_{OC}$ values suggest the occurrence of marine OM although a contribution of continental inputs and/or degraded material can be locally observed. This is coherent with the high values of qualitative descriptors, which indicate a high lability of sedimentary OM, and spatial variability associated to its origin.