Carbon stable isotope record in the coral species *Siderastrea stellata*: a link to the Suess effect in tropical South Atlantic Ocean

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Coral skeletons keep high-quality geochemical information (*e.g.* stable isotopes, trace and minor elements) that can tell us about the tropical ocean history and improve our knowledge about past climate parameters beyond the instrumental record. Carbon stable isotopes from coral skeletons (δ^{13}Ccoral) have been used as multiple proxy (*e.g.* cloud coverage, zooplankton uptake) in short-term trends (*i.e.* inter-annual variation). Long-term changes in coral δ^{13}C have been attributed to the alteration in the isotopic composition of the dissolved inorganic carbon (DIC), as a result of the atmospheric δ^{13}C perturbation provoked by the anthropogenic CO_2 input (fossil fuel burning and deforestation) known as Suess Effect.

Here we report three δ^{13}C coral-based records from the coral species *Siderastrea stellata* (12SFB-1, 13SS-1 and 13SS-2) a common reef builder at the Tropical South Atlantic Ocean. U/Th dating for the coral record of the colonies 12SFB-1, 13SS-1 and 13SS-2 were 28.9 ± 3.1, 60.44 ± 0.87 and 70.1 ± 1.3 years, respectively. All the three δ^{13}C records presented a decreasing trend, with a depletion rate of about $-0.013‰.yr^{-1}$(12SFB-1), $-0.025‰.yr^{-1}$ (13SS-1) and $-0.021‰.yr^{-1}$(13SS-2). The decreasing rate for the colonies 13SS-1 and 13SS-2 were similar to the reported trend for the δ^{13}C of atmospheric CO_2 (-0.023 to $-0.029‰.yr^{-1}$), suggesting that these corals are recording long-term changes in the carbon isotopic composition of the local DIC, probably to the up take of anthropogenic CO_2 by the oceans.