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


1NEG-LABISE, Federal University of Pernambuco, Brazil.
2HISPEC, Department of Geosciences, National Taiwan University, Taiwan.
3RECOR, Department of Oceanography, Federal University of Bahia, Brazil
4CPTEA, State University of Bahia, Brazil.
5Department of Geosciences, University of Copenhagen, Denmark.
6University of Exeter, Camborne School of Mines, Penryn Cornwall, UK.
7Chesapeake Biological Laboratory, Maryland University, USA.

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 (δ¹³C_coral) 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 δ¹³C have been attributed to the alteration in the isotopic composition of the dissolved inorganic carbon (DIC), as a result of the atmospheric δ¹³C perturbation provoked by the anthropogenic CO₂ input (fossil fuel burning and deforestation) known as Suess Effect.

Here we report three δ¹³C 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 δ¹³C 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 δ¹³C of atmospheric CO₂ (−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 uptake of anthropogenic CO₂ by the oceans.