

## Carbon and oxygen isotopes in *Mussismilia hispida*: A promising coral-based record for the tropical Atlantic Ocean

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Geochemical coral-based records provide high-quality information about the tropical ocean history. Such geochemical information can be used as proxies to environmental conditions. Modern corals or snapshots derived from fossil corals provide an important archive to reconstruct past seasonal to decadal climate variations of the tropical ocean-atmosphere system. Coral records have been reported for different tropical localities in the Pacific Ocean, Indian Ocean and Caribbean, however, only a few studies in the South Atlantic Ocean have provided coral-based climate records, highlighting the need of testing the available coral species at this region. The species *Mussismilia hispida* is an important reef builder of the Brazilian reef systems. Here we present an isotopic record from one specimen of *M. hispida* collected at Rocas Atoll, tropical South Atlantic Ocean. We used U-series data and isotopic cycles for chronology, which revealed a coral record dated from 1940 to 1956. The growth rate varied from 3.5 to 4.6 mm year<sup>-1</sup>, with mean value of 4.1 mm year<sup>-1</sup>. The  $\delta^{13}\text{C}$  data varied from 0.38 to 2.40‰, with mean value of 0.91 ± 0.59‰. The  $\delta^{13}\text{C}$  profile revealed short cycles, which is interpreted as annual and probably driven by photosynthesis activity of zooxanthellae (influenced by cloud cover) and larger cycles that has period of 7 years.  $\delta^{18}\text{O}$  ranged from -4.27 to -1.32‰, with mean value of -3.29 ± 0.42‰.  $\delta^{18}\text{O}$  profile presented only short cycles, which are associated to the annual variation of SST. Anomalous  $\delta^{18}\text{O}$  values at the year of 1949-1950 might be associated to the La Niña phase of an ENSO event, in which an increase in precipitation could have led to depleted  $\delta^{18}\text{O}$  of local sea water. The clear seasonal isotopic signal recorded in *M. hispida* makes this species as a promising coral-based record for the South Atlantic Ocean.