



## **Boron isotopic composition of *Porites* corals over the past 500 years in the South China Sea: Evaluating the potential controlling factors**

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As the largest marginal sea in the East Asia, the South China Sea is sensitive to the environmental changes both in Asia landmass and western Pacific Ocean. Thus, the cause-consequence feedback systems between the seawater chemistry and environmental change in the South China Sea encompass various interactions and controlling factors on different spatial and temporal scales. Global and regional (e.g., continental sources, and the East Asian monsoon system) factors may have a simultaneous impact on the coral records. However, the representative meanings of coral records in the South China Sea are still poorly understood. Here we present an age-controlled coral boron isotopic ( $\delta^{11}\text{B}$ ) record in the Xisha Islands, the northern South China Sea, from AD 1466 to AD 1960. We applied micro-sublimation technique and MC-ICP-MS measurement to provide a low-blank and highly precise  $\delta^{11}\text{B}$  measurement. The  $\delta^{11}\text{B}$  values of the coral specimens varied from 20.8‰ to 26.0‰ which the variation is larger than the observation in the western Pacific Ocean within the same periods. The  $\delta^{11}\text{B}$  data showed a gradual increase during AD 1466-1829 and a relatively sharp decline then until AD 1960. The anthropogenic emission of  $\text{CO}_2$  may explain the decline of coral-inferred seawater pH over the past 200 years but not for the period of AD 1466-1829. An evaluated correlation was observed between the variation of coral  $\delta^{11}\text{B}$  values and the monsoon-associated upwelling phenomenon, which implies a significant influence of the Asian monsoon system on boron geochemistry in the northern SCS. This study will provide a comprehensive discussion regarding the potential factors controlling the boron isotopic composition in the northern South China Sea over the past 500 years.