Different CO_2 history recorded in boron isotope ratio of two surface dwelling planktonic foraminifers

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During the last deglaciation (ca. 19 – 11 ka), partial pressure of CO_2 (pCO_2) of the atmosphere increased by ~80 μatm. Many paleoceanographers point out that the ocean had played an important role in atmospheric CO_2 rise, since the ocean have 60 times larger capacity to store carbon compared to the atmosphere. However, evidence on where carbon was transferred from the ocean to the atmosphere is still lacking, hampering our understanding of global carbon cycles in glacial-interglacial timescales. Boron isotope of skeletons of marine calcifying organisms such as corals and foraminiferas can pin down where CO_2 source/sink existed, because boron isotopes of marine calcium carbonates is dependent on seawater pH, from which pCO_2 of the past seawater can be reconstructed. In previous studies using the boron isotope teqnique, Martinez-Boti *et al*. (2015, *Nature*) and Kubota *et al*. (2014, *Scientific Reports*) revealed that central and eastern parts of the equatorial Pacific acted as a CO_2 source (i.e., CO_2 emission) during the last deglaciation, suggesting the equatorial Pacific's contribution to atmospheric CO_2 rise. However, some conflicting results have been confirmed in a marine sediment record from the western part of the equatorial Pacific (Palmer & Pearson, 2003, *Science*), making the conclusion elusive. In this presentation, we will show new boron isotope records for the last 35 ka on two species of surface dwelling foraminiferas (*Globigerinoides ruber* and *Trilobatus sacculifer*) which was hand-picked separatedly from marine sediment core recovered from the West Caroline Basin (KR05-15 PC01; 0.1°S 139.5°E) (Yamazaki et al., 2008, *GRL*). Two records showed different time history, namely surface pCO_2 reconstruction from boron isotope ratio of *G. ruber* shells showed steady increase in close equilibrium with atmospheric pCO_2, but that from *T. sacculifer* did not. This results suggests that, at least in this study area, *T. sacculifer* shells with sac chamber convey subsurface information rather than surface one.