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Glacial / Interglacial sea temperatures changes at the southern edge of the West Pacific Warm Pool over the last 800 ka

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Assessing past changes in thermocline dynamics over the last glacial-interglacial (G/IG) cycles is critical to evaluate variations in oceanic circulation occuring at G/IG transitions.

Here we reconstruct hydrological variations over the last 800 ka at the southern edge of the Western Pacific Warm Pool, in the Gulf of Papua (IMAGES MD05-2930 sediment core) using combined Mg/Ca and δ^{18}O analyses in planktonic foraminifera. We study two morphotypes of the species *Globigerinoides ruber*: G. *ruber sensu stricto* (ss) and G.*ruber sensu lato* (sl) because their chemical and isotopic signatures match two different calcification depths (0-30m and 50-100 respectively).

Over the last 800 kyrs, our record shows marked G/IG variability. The amplitude of G/IG variations over the last 9 terminations is in average about 3˚C for G. *ruber ss*, and about 4˚C for G. *ruber sl*. The mean temperature difference between the two morphotypes (ΔT) exceeds the standard error of SST estimations, indicating that the temperatures difference likely reflects gradients in the upper water thermal structure rather than analytical errors.

The ΔT is maximal during glacial periods and shows no difference during interglacial periods, when both morphotypes record similar temperatures. This suggests a deepening of the thermocline during interglacial periods.

At longer time-scales, these morpho-specific temperature records show an unexpected trend: ΔT increases from 800 ka to the Holocene. This trend is accompanied by a strengthening of G/IG SST amplitudes after the Mid Bruhnes transition, highly correlated with the CO_2 EPICA record in Antarctica ice core. The shoaling of the thermocline during the late Pleistocene glacial stages might indicate a strengthening of the subtropical circulation through a large-scale change in the mean state, though regional changes might also have contributed to this pattern.

Ongoing stable isotope analyses on G. *ruber sl*. will help to constrain the upper water density gradients in order to quantify the respective impacts of local changes in the hydrology from larger scale processes.