The glacial-Holocene evolution of water masses in the Bay of Bengal based on $\delta^{18}O$ and $\delta^{13}C$ analyses

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The Indian Ocean is an important area to understand the global ocean circulation, especially for intermediate water masses (IW). We combined benthic foraminiferal stable isotope records ($\delta^{13}C$ and $\delta^{18}O$) and statistical analyses of benthic assemblages from Core MD77-176 (14°30'5N, 93°07'6E, 1375m [1]) to recontruct changes in the IW in the Bay of Bengal since the Last Glacial Maximum (LGM).

$\delta^{13}C$ and $\delta^{18}O$ analysis were performed on *Cibicidoides pachyderma*, *C. wuellerstorfi* and *Uvigerina peregrina*. The $\delta^{18}O$ values range between 1.66 to 3.61‰, with a maximum during the LGM, a marked decrease at 12.7 ka and lower values during the Holocene. Coeval variations are observed between planktonic [1] and benthic $\delta^{18}O$ records during the LGM, whereas inverse trends exist during the Late Deglaciation and across the Holocene. The $\delta^{13}C$ values vary from -0.46 to 0.54‰ and are lower during the LGM, at 12.54 and 9.82 ka, and higher during the Holocene. The records tend to show, therefore, that during the Holocene, the IW were better ventilated than during the LGM, suggesting a change in the source of IW and/or in the circulation rate. Changes in assemblages are in good agreement with the geochemical records, suggesting a higher oxygen concentration and lower nutrients contents, associated to an oligo– to mesotrophic environment during the Holocene. However, negative shifts in the $\delta^{13}C$ are observed during the Holocene, linked to a lower oxygen concentration and/or meso- to eutrophic conditions, reflecting events of poorer IW ventilation and/or water pulses from another source. Future analysis (elemental ratios and ^{14}C) will help to decipher the mechanisms ruling past changes in the IW at the core site.

[1] Marzin *et al*. (2013) *Climate of the Past* **9**, 2135-2151.