Changes in carbon and oxygen isotopes of benthic foraminifera in the East China Sea since the last glacial maximum

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The continental shelves shallower than 200 m water depths occupies more than 70 % of the area of East China Sea (ECS). During the last glacial maximum (LGM), sea-level dropped by 120 m. Therefore, vast area of the ECS continental shelves were aerially exposed. Here we present carbon and oxygen isotopes of benthic foraminifera in sediment core from the Danjo Basin, northern ECS (KY07-04-PC01, 31˚38.35’ N, 128˚56.64’ E, 758 m water depth). Foraminiferal shells are composed of calcite ($CaCO_3$). Carbon isotope ratio ($\delta^{13}C$) of benthic foraminifera is used as a proxy for nutrient concentrations Therefore, benthic foraminiferal $\delta^{13}C$ is useful for reconstructing past water mass structures. Oxygen isotope ratio ($\delta^{18}O$) of benthic foraminifera is used as a proxy for ice volume and water temperature. Two benthic foraminiferal taxa *Uvigerina* spp. and *Hyalinea balthica* were picked up from KY07-04-PC01 sample and were used for $\delta^{13}C$ and $\delta^{18}O$ measurements. The $\delta^{13}C$ of *Uvigerina* spp. during LGM was ~2 ‰heavier than those of Holocene. This offset can be explained by oscillation of two water masses in ECS: cold and nutrient-rich Chinese coastal water was prevailing in glacial semi-closed ECS; warm and nutrient-depleted Kuroshio water increased since deglaciation with sea-level rise. The $\delta^{18}O$ of *Uvigerina* spp. gradually decreased from 3.76 ‰during LGM to 2.39 ‰during late Holocene. The 1.36 ‰ $\delta^{18}O$ offset is caused by ice volume and water temperature. Because the ice volume effect for benthic $\delta^{18}O$ between LGM and present is estimated to be 1.1 ‰, the residual 0.27 ‰is equivalent to water temperature change of 1 ℃. This suggests intermediate water temperature in northern ECS has risen by 1 ℃ since LGM. There are two morphology in *Uvigerina* spp., with more spiny and less spiny. Because offsets of $\delta^{13}C$ and $\delta^{18}O$ between the two morphologic types, it is desirable to measure separately. *Hyalinea balthica* showed ~1 ‰lighter $\delta^{13}C$ and $\delta^{18}O$ values than those of *Uvigerina* spp. In addition, it was time-consuming for cleaning *Hyalinea balthica* shells. Thus, *H. balthica* is not a proper benthic foraminiferal species for $\delta^{13}C$ and $\delta^{18}O$ measurements.

