PALEOHYDROLOGY OF JAPAN SEA DURING THE LAST 48 KYR: A ULTRA-HIGH RESOLUTION STUDY OF SEDIMENTS FROM NE JAPAN SEA

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We constructed ultra-high resolution profiles of carbon and oxygen isotopic composition of both planktonic (*Globigerina bulloides* and *G. umbilicata*) and benthic foraminifera (*Uvigerina akitaensis* and *Angulogerina* sp.) and several biomarkers in a sediment core recovered from Northeastern Japan Sea, off Akita to reconstruct the paleohydrology in NE Japan Sea. The chronology of the sediment was constructed based on 14 radiocarbon dates of mostly single species planktonic foraminifera (*G. bulloides*), indicating that the core covers last 48 cal. kyrs BP with mean sedimentation rate of 15.1 cm kyr^{-1}. Isotopic compositions were determined in every 0.5-1 cm throughout the core corresponding to the average time resolution of 70 yrs. We found a striking (˜2 per mil) negative excursion in planktonic foraminiferal carbon isotopic compositions from 16.7 to 16.0 cal ka BP, immediately after termination of thinly-laminated layer-2 (TL-2) (16.9 cal ka BP). Carbon isotopic composition of *Angulogerina* sp. was also low value (-3.2 per mil) at 16.6 cal ka BP. These isotopic excursions occurred simultaneously with decrease in carbon isotopic compositions of biphytanes (-25.4 to -22.7 per mil at 16.5 cal ka BP), biomarkers for planktonic archaea inhabited throughout water column. These records suggest that the carbon isotopic composition of DIC in the entire water column decreased simultaneously in this period. Oxygen isotopic composition of the planktonic foraminifera increased sharply at that time, the negative excursion of carbon isotopic compositions coincides with the inflow of surface water through Tsugaru Strait into Japan Sea. Therefore, the negative excursion of DIC may ultimately be triggered by inflow of huge volume of the seawater into the semi enclosed Japan Sea. The negative excursion of carbon isotopic compositions may reflect additional DIC that is formed by oxidation of ^{13}C-depleted methane outgassing from the seafloor. The molecular distribution of biphytanes does not demonstrate the pattern of methane-oxidized archaea. Therefore, we conclude that the excursion was caused by either transport of the methane-derived DIC from other areas or upward diffusion of ^{13}C-depleted DIC from deeper water associated with the destruction of water column stratification at the end of TL-2.