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Planktic foraminiferal assemblages and stable isotope records of the southern Japan Sea during the last 27,000 years

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Planktic foraminiferal faunal and oxygen isotope changes during the last 27 cal kyr BP were examined using two well-dated cores KT96-17 P-2 and GH87-2 K-B recovered from the southern Japan Sea. Thirteen species belonging to six genera were identified in down-core samples. Dominant species with maximum percentages greater than 10% in at least one sample were *Neogloboquadrina pachyderma*, *Globigerina bulloides* (thick-walled form), *Globigerina umbilicata*, *Globigerina quinqueloba*, *Globigerinita uvula*, and *Neogloboquadrina incompta*. These six species accounted for 95.5% of the planktic foraminiferal assemblage in each sample of core KT96-17 P-2 and 94.7% in each sample of core GH87-2 K-B. In addition to these species, *Globigerinoides ruber*, *Neogloboquadrina dutertrei*, *Pulleniatina obliquiloculata*, *Globigerinoides tenellus*, and *Globigerinita glutinata*, with maximum percentages of less than 3%, were also recognized. Since 27 cal kyr BP, planktic foraminiferal faunas have exhibited major changes in both flux and abundance, suggesting three major paleoenvironmental stages consisting of the last glacial period, the subsequent deglacial period, and the postglacial period. In the last glacial stage, surface water in the Japan Sea was covered by cold, nutrient-rich, and less-saline water because circulation through shallower straits was probably restricted due to the eustatic sea level lowering. Low-salinity water was stratified in the water column, preventing deep ventilation in the sea and leading to anoxic bottom conditions. During the subsequent deglacial stage when exchange with the open ocean was renewed, coastal water from

the East China Sea flowed into the Japan Sea through the Tsushima Strait. Low-salinity surface water of the last glacial maximum disappeared, and deep convection began again, leading to oxic bottom conditions. After low-salinity and eutrophic surface water declined, the Oyashio Current probably flowed into the Japan Sea through the Tsugaru Strait. The cold and dense Oyashio Current water enhanced deep ventilation actively. However, deep circulation driven by the East China Sea coastal water or Oyashio Current water was weaker than that at present. In the postglacial stage, the warm Tsushima Current began to flow into the Japan Sea. The modern deep circulation system was formed in association with the Tsushima Current. We will discuss the timing of above mentioned events based on the tephrochronology and AMS ^{14}C dating of 14 horizons of the two cores.

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