

Holocene Environmental Change and Their Factor in the Western Indian Sector of the Southern Ocean

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Compared with the drastic climate change during the last glacial period, variability of Holocene climate has received less attention, particularly in the Indian Sector of the Southern Ocean. Here, we present the century-scale record of diatom assemblage and isotope changes from the Conrad Rise sediment during the last 10,000 cal. yr BP. The rapid sedimentation of diatom ooze on the Conrad Rise was produced by the long and slender diatom as *Thalassiothrix antarctica* frame and filling up diatom as *Fragilariopsis kerguelensis*. Although the constituents of major diatoms were same throughout the core, relative abundance of secondary in significant constituents fluctuated. Before 9,940 cal. yr BP, the winter sea-ice and following cold water covered over the Conrad Rise. The timing of sea-ice retreat after the deglaciation period on the Conrad Rise was later by about 1,500 yr than that in the Atlantic and eastern Indian Sector. After the deglaciation, the Polar Front moved southward during the early Holocene optimum, and the water of north Antarctic Zone covered the Conrad Rise for 650 yr. Since 9,290 cal. yr BP, solar insolation and irradiance were strongly influenced to the sea surface temperature and primary productivity. Following 1,500 yr since the Neoglacial onset, the productivity in the high-latitude Indian Sector was increased. Furthermore, periodic delta 18O and cold-water diatom taxa spikes (200 and 300-500 yr intervals, relatively) have punctuated the climate stability since 9,290 cal. yr BP, which is likely associated with solar activity. Such short-term SST and cold water taxa fluctuations were synchronous with the delta deuterium values of the east Antarctic ice core

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