

Ocean front migration over the Conrad Rise in the Indian Sector of the Southern ocean since the last glacial maximum

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The rapid sedimentation of diatom ooze is deposited on the halfway up the Conrad Rise in the Indian Sector of the Southern Ocean. Based on diatom assemblage analysis of this sediment, paleoenvironmental changes since the last glacial maximum (LGM) was reconstructed by decades to hundred year scales. Changing of diatom assemblage in the Conrad sediment was highly consistent with the changes of paleoclimate record in the Antarctic ice cores. *Fragilariopsis kerguelensis* has been dominant taxon since the LGM. Even though relative abundance of this taxon kept over 70 % in the Holocene (Katsuki et al., 2012), the relative abundance was decreased in the early deglaciation, and it dropped to about 60% at the LGM. Instead of the decreasing *F. kerguelensis*, relative abundance of *Chaetoceros* resting spore, sea-ice taxa, and polar taxa showed high values in the LGM and early deglaciation. In the Southern Ocean, productivity of *F. kerguelensis* and *Chaetoceros* resting spore valves are conflicted. Much of the new production in iron-rich areas as the sea of eastern Antarctic Peninsula is dominated by fast growing, weakly silicified diatom genera, including spore-forming species of *Chaetoceros*. On the other hand, *F. kerguelensis* is dominated in iron-limit high nutrient area (Abelmann et al., 2006). Synchronous increasing of *Chaetoceros* resting spore and sea-ice taxa in the early deglaciation and the LGM are probably indicated the followings: At first, seasonal sea-ice covered over the Conrad Rise in the early deglaciation and the LGM. At second, this sea-ice was flow-in from the southeastern Atlantic Ocean including eastern Antarctic Peninsula. At third, this sea-ice carried the snow-settled air dust including iron, and melting sea-ice released the iron into the ocean at spring at that time. Furthermore, periodic diatom oscillation has punctuated the climate stability since the LGM. Lange of oscillation was magnified during the early deglaciation, which is likely associated with ice-cover area variation.

References

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