High-resolution $CaCO_3$ variation of core COR-1bPC in the Conrad Rise in the Indian Sector of the East Antarctic

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The Southern Ocean has played an important role in the global climate system. Ocean alkalinity change in the surface Southern Ocean is one of the crucial factors to explain glacial pCO_2 reduction. Alkalinity increases in glacial periods are driven by reduction in North Atlantic Deep Water supply, which leads to increases in deep-water nutrients and dissolution of carbonate sediments and to increased Circumpolar Deep Water upwelling in the surface Southern Ocean. A core COR-1bPC (54°16.55'S, 39°46.24'E; water depth, 2835 m; core length 10.47 m) was collected from the south-west flank of the Conrad Rise during Cruise KH10-07 by R/V Hakuho-Maru in Dec. 2010. Age control for the core COR-1bPC was determined by AMS ^{14}C dating and $\delta^{18}O$ stratigraphy of planktonic foraminifers, showing the clear transition from the last glacial period into the Holocene. The sedimentation rate of core COR-1bPC is fairly high more than 2.5 cm/yr. High-resolution $CaCO_3$ profile of core COR-1bPC shows the low and consistent $CaCO_3$ contents during the glacial periods, which confirms the enhanced carbonate dissolution in the bottom water. During the deglacial periods, $CaCO_3$ contents fluctuated in parallel with the climatic changes such as Bølling-Allerod, Younger Dryas, and Pre-Boreal events. Particularly, it is notable to note that a series of $CaCO_3$ fluctuations can be observed distinctly during the Holocene, in contrast to no variation of ice-core $\delta^{18}O$ records. Short-term variation of $CaCO_3$ contents at the Conrad Rise during the Holocene will be discussed in more detail for the purpose of verifying that the Conrad Rise is the best site for revealing the evolution of Antarctic cryosphere such as the role of Antarctic Circumpolar Current and the migration of Antarctic Polar Front during the Quaternary.