

Foraminiferal Assemblages and Geochemistry characteristics in the Dongsha Cold-Seep Activities Area, northern South China Sea

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A 1375-cm-long gravity core (Site 973-4) was retrieved in Dongsha area, a typical cold-seep area in northern South China Sea. This core has a very shallow sulfur-methane interface that about 9 m below sea floor. ¹⁴C dating of planktonic foraminifera established the chronology of this core, and oxygen and carbon isotopic analysis and benthic foraminiferal assemblages also implied some cold-seep activities with time scales. The negative deviation ($\delta^{13}\text{C}=-1.34\text{‰}$) of planktonic foraminifera has been recorded at Site 973-4, which might be caused by surges of cold seep fluid in millennium scale. The isotopic analysis of planktonic were used to evaluate the effect of diagenesis on carbon composition. Cold-seep activitise may make considerable contribution to $\delta^{13}\text{C}$ negative deviations, but diagenesis was not the possible cause of negative carbon isotopic compositions in Site 973-4. Furthermore, the more negative $\delta^{13}\text{C}$ of cold-seep benthic foraminifera (compared to a non-seep site) in LGM (or early Holocene) being followed by a convergence of $\delta^{13}\text{C}$ in all documented sites can be explained by the attenuation of cold-seep activities. Foraminiferal assemblages of Site 973-4 also support to the attenuation of cold-seep activities. In the Holocene sediments, non-cold-seep foraminiferal assemblages, with similar characteristics as adjacent seep sites, had a higher value of abundances, diversity and Shannon-Wiener Index as well as a lower value of infauna percentage compared to those before Holocene.