

Paleoenvironmental Significance of the Holocene sedimentary records on the inland shelf of the East China Sea and the Okinawa trough

Jie Zhang (1), Qi Li (2), Guofan Zhang (3), and Qiong Wang (4)

(1) China University of GeoSciences, Beijing, China (1391582475@qq.com), (2) China University of GeoSciences, Beijing, China (liqi@cugb.edu.cn), (3) China University of GeoSciences, Beijing, China (316653685@qq.com), (4) China University of GeoSciences, Beijing, China (1092445791@qq.com)

The continental shelf of East China sea is divided into the inland shelf and the outer shelf by 50-60m isobath. The bottom of the inland shelf is relatively complicated, Large amounts of sediment are transported to the inland shelf waters from many rivers along the coast, and stack in different regions of the seabed. The Okinawa trough is located on the outer side of the East China Sea shelf, which is a typical back-arc tensioning basins, and it has shallow and deep sea sedimentary environment .

The sedimentation rate is mainly restricted by the source, climate and sedimentary dynamic environment, it's an important index to reflect the source, sedimentation and sedimentary environment. The sea-level rise, the distance between source and sedimentary area, and the seabed currents will all cause changes in the grain size of the sediments. These factors are always the embodiment of the paleoenvironment and paleoclimate changes. The characteristics of elemental geochemistry are of great significance to the reflection of the paleoenvironment. The evolution history of the sedimentary environment can also be understood through the analysis of the time variation of the elements or elements combination in the sediments of the seabed.

The study use the shared voyage of the NSFC to collect samples of columnar sediments on the East China Sea inland shelf during 2016-2017. The sediment grain size analysis and XRD scanning experiments were used to compare the sedimentary records and paleoenvironmental characteristics between the inland shelf and the trough.

At present, the project group has obtained 11 columnar samples on the East China Sea shelf, with a total of 18.13 meters. According to the preliminary chronology analysis, the age at the bottom of the gravity column sample was about 7.5ka. Combined with the completed grain size test analysis data, we can further analyze the trend of sediment grain size change since 7.5ka, and extract the response characteristics of geological events during the warm period change. According grain size Changes can respond to climate cold or East Asian monsoon enhancement. For example, Preliminary analysis, the grain size changes in the study may be responsive to the 7.3kaBP cold event or the strong cooling event during the second new ice phase of the 5.5ka.

In the study, the clay mineral composition of the sediments was obtained by the comprehensive analysis of the XRD experiment, and the main material from the Yangtze River was determined. Combine the geological structure, marine environment and climate change records of the East China Sea shelf and the Okinawa trough area to get valuable discussions and results in the context of environmental evolution response between the East China Sea inland shelf and Okinawa trough.

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