

## Carbon isotope fluctuations of the latest Ordovician shallow marginal facies in the Yangtze basin, South China

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The environmental change across the Ordovician - Silurian boundary is accepted as one of the Phanerozoic Big Five mass extinctions. The marine biota which inhabited in shallow and deep sea caught miserable damage. The Yangtze basin is one of the best study areas in the world because Yangtze basin of South China Block was located as continental sea in the equatorial zone and there are shallow and deep marine deposition facies on the same basin.

Tongtzi city, Guizhou, is located in south 100 km of Chongqing and the Ordovician - Silurian there is reconstructed as representing comparatively shallow marine facies on the Yangtze basin (e.g. Chen et al 2000b). A lot of graptolite fossils occur from late Ordovician black shale in this section. Biostratigraphy is well established by graptolite in this area (Chen et al 1999, 2000b). However, identification of OS boundary was not clear in this section because there is a thick carbonate unit which is graptolites-barren. In this study, I performed geochemical analysis for the first time in both sections of Honghuayuan and Daijiague in Tongtzi. The analysis includes mineral compositions by XRD, total organic carbon (TOC) contents, the measurements of organic carbon isotope ratio and inorganic carbon and oxygen isotope ratio. As the result, the organic carbon isotope ratio shows a positive excursion (Honghuayuan 5 permil and Daijiague 1 permil) same as in other sections. And I am able to classify carbon isotope stages by the organic carbon isotope fluctuations. This isotope stage by organic carbon is very compatible with inorganic carbon isotope ratio and TOC contents.

On the other hands, the inorganic carbon isotope ratio is affected by local carbon supply in Yangtze basin. It is suggested that terrigenous influx increased by regression and perhaps was enhanced by weathering at the onset of the Hirnantian glaciation. The amounts of feldspars and clay minerals increased too. The expansion of primary productivity is caused by abundant nutrients from land source, and graptolitic shale deposited in Yangtze basin. In addition, carbonate units formed in shallow margin of Yangtze basin with sea-level fall and influx of  $\text{Ca}^{2+}$  and  $\text{HCO}_3^-$  derived from weathering.

There were two stages mass extinction that was related to onset and decay of Hirnantian glaciation in latest Ordovician. There is a possibility that the sea-level fall reached 100 m at the maximum. Therefore, almost shallow marginal facies had been exposed in latest Ordovician, and continuous sedimentary records are not left. However, sea-level was almost not fall on Yangtze basin, and sedimentation continued on the shallow margin. The ultimate purpose is to elucidate the mechanism and processes of the OSB events, but the particular objectives of the current study are to document and to interpret facies changes of shallow margin of Yangtze basin.