Change of the carbon cycle in G-L boundary using numerical value calculation

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The largest extinction of Big five in Phanerozoic is observed in end of Permian period.The large extinction include two step, Guadalupian- Lopingian boundary (GLB) and Permian- Triassic boundary (PTB) (Sepkoski, 1984; Knoll et al., 1996; Isozaki, 1997; Stanley and Yang, 1994; Kaiho et al., 2005).Therefore, we need to study from GLB to PTB, in order to understand the correlation between extinction and environmental changes. we study life cycle changes and influence to oceanic environment in extinction by changes of carbon isotope ratio.
There were many previous studies of carbonate and organic carbon isotope ratio from GLB to PDB. The carbon isotope records show over +6 permil before GLB, calling to Kamura event. The d13Ccarb after Kamura event decrease to ca. 0 permil around GLB. Moreover, the d13Ccarb decreases from ca. +3 permil to ca. -2 permil at PTB and shows large excursions from PTB to middle Triassic (Isozaki et al., 2007a,b; Korte et al., 2005a,b; Payne et al., 2008). On the other hand, organic carbon isotope date show about -30~-28 permil in deep sea sediment (NIshikane et al., 2014). And decoupled carbonate and organic carbon isotope ratio is observed in Iwaizaki carbonate section, South of Kitakami belt. The section corresponds to the Kamura event before GLB (Tobita et al., in prep).
We discuss the change of carbon cycle to reproductive carbonate and organic carbon isotope changes by the numerical value calculate.We assume an inorganic and an organic reservoir in the sea. Flows (Photosynthesis and Remineralization, organic burial, carbonate burial) are a ratio of each reservoir’s size.The results suggested changing amount of organic matter in GLB. The changes might be triggered by large extinction.The large organic matter might cause a global expansion of oxygen minimum zone (OMZ).

Keywords: GL boundary, Carbon cycle, extinction

