

$^{87}\text{Sr}/^{86}\text{Sr}$ chemostratigraphy of Ediacaran Doushantuo Formation in the Yangtze Craton, South China

*Yusuke Sawaki¹

1. The University of Tokyo

The Ediacaran period records one of the most dramatic biological episodes in Earth's history. To track environmental changes occurring in the Ediacaran, multi-geochemical proxies have been reported by a number of studies. Ediacaran sedimentary rocks in South China figure prominently in such studies, because they are fossiliferous and accumulated at various depositional settings from shallow platform to basin facies. Recent extensive geochemical works for the Doushantuo Formation in South China demonstrate that $\delta^{13}\text{C}$ values of inorganic carbon were variable throughout the Ediacaran period. On the other hand, a drastic change in weathering influx from continents is thought to have major influences on the change in seawater composition and on biological activity. Its flux can be estimated from the $^{87}\text{Sr}/^{86}\text{Sr}$ ratios of carbonate rocks. However, the existing $^{87}\text{Sr}/^{86}\text{Sr}$ values are limited to shallow marine deposits, which leaves ambiguity in a variation of $^{87}\text{Sr}/^{86}\text{Sr}$ ratios in outer ocean.

We conducted drilling at Siduping, Tianping, and Weng'an sections in South China to obtain the Ediacaran complete sedimentary sequences deposited at slope and shoal facies. We newly report stratigraphic profiles of the $^{87}\text{Sr}/^{86}\text{Sr}$ ratios at the three sections. $^{87}\text{Sr}/^{86}\text{Sr}$ chemostratigraphy demonstrated some diachronous natures of $\delta^{13}\text{C}$ within the Doushantuo Formation. The enhanced continental weathering during Gaskiers glaciation likely promoted bacterial sulfate reduction and aerobic respiration of organic matter. These resulted in low $\delta^{13}\text{C}$ values of dissolved inorganic carbon and accumulations of phosphate and dissolved CO_2 species in seawater, and eventually induced the deposition of phosphorites at the shelf margin. High $^{87}\text{Sr}/^{86}\text{Sr}$ ratios during the largest negative $\delta^{13}\text{C}$ anomaly in the Ediacaran can be also recognized in the continental slope sediment. This fact supports that globally high continental weathering rate led to massive remineralization of organic matter and a consequent significant negative $\delta^{13}\text{C}_{\text{carb}}$ excursion.

Keywords: radiogenic Sr isotopic ratio, South China, The Ediacaran