Secular variation in $^{87}Sr/^{86}Sr$ ratio of seawater in the Ediacaran

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The Ediacaran period records one of the most dramatic biological episodes in Earth's history; for example, the emergence of a number of large multi-cellular animals. To understand perturbations occurring in the Ediacaran, multi-geochemical proxies have been reported from Ediacaran strata by many researchers. In south China, strata deposited in various sedimentary environments, from shallow platform to slope facies, well crop out. Intensive carbon isotope analyses from the Ediacaran strata in south China revealed spatial carbon isotope variations according to the sedimentary environments [e.g. 1, 2]. For example, large negative carbon isotope anomaly called Shuram excursion was not observed in slope facies carbonate rocks.

The weathering influx from continents is thought to be a major influence on the change in composition of ancient seawater and on biological activity. Its flux can be estimated from the $^{87}Sr/^{86}Sr$ ratio of carbonate rocks. Due to the large isotopic difference between following two main sources of strontium, the $^{87}Sr/^{86}Sr$ composition of seawater tracks the long-term changes in the weathering of the continental surface relative to the hydrothermal flux. For further understandings of spatial variation of seawater $^{87}Sr/^{86}Sr$ ratio in the Ediacaran, we carried out on-land drilling of the Doushantuo and Dengying Formations (Fm) at Three Gorges, Weng'an, Siduping, and Tianping areas. Rock powders prepared from carbonate rocks were dissolved in 2 M acetic acid. After removing coexisting matrix elements, Sr isotope ratios were measured with a MC-ICP-MS. The results show that $^{87}Sr/^{86}Sr$ values of the lower part of the Doushantuo Fm fluctuate around 0.708 with minor differences. Subsequently, the $^{87}Sr/^{86}Sr$ values increase to *ca.* 0.709 through upper Doushantuo Fm. Along with the data from previous studies [e.g. 3], $^{87}Sr/^{86}Sr$ values in the Ediacaran carbonate rocks exhibit similar stratigraphic profiles, but those in Weng'an area keep high (0.709) throughout the Ediacaran.

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[2] Zhu et al., (2013) *Precam. Res*. **225**, 7–28.
[3] Cui et al., (2015) *Chem. Geol*. **405**, 48-62.