

初期カンブリア紀の高い大陸風化速度 Intensive continental weathering rate in the Lower Cambrian: evidenced from Sr isotope ratios preserved in the strata at

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One of the most important times in biological evolution was from the first appearance of soft-bodied animals and possibly Metazoan animals in the late Neoproterozoic to the sudden diversification of animals with mineralized skeletons in the Cambrian. Neoproterozoic to Cambrian fossiliferous succession is well exposed in South China (e.g., Luo et al., 1984); it has been much investigated using biostratigraphy, sequence stratigraphy and chemostratigraphy (e.g. Condon et al., 2005; Zhou and Xiao, 2007; Zhu et al., 2007). We carried out on-land drilling of the Ediacaran to Cambrian sedimentary succession in Three Gorges, South China. The drill-sampling allows us to minimize the effect of secondary alteration and oxidation on the surface and to make a very continuous chemostratigraphy at intervals of centimeters. Now, members of our group at Tokyo Tech and the Univ. of Tokyo have analyzed several kinds of isotope ratios to estimate paleo-environment; including carbon, oxygen, nitrogen and strontium isotope ratios.

The weathering influx from continents is thought to be a major influence on the change in composition of ancient seawater and on biological evolution. Its flux can be estimated from the $87\text{Sr}/86\text{Sr}$ ratio of carbonate rocks. We present a new detailed chemostratigraphy of $87\text{Sr}/86\text{Sr}$ in the Three Gorges region in South China. The result shows that $87\text{Sr}/86\text{Sr}$ ratios had decreased from ca. 0.709 around the Precambrian/Cambrian boundary to ca. 0.7085 at the Atdabanian stage. Subsequently, $87\text{Sr}/86\text{Sr}$ ratios recovered to ca. 0.709 at the end of Early Cambrian. We calculated secular variation of weathering flux using the analyzed data, suggesting intensive continental weathering rate in the Lower Cambrian.

Keywords: $87\text{Sr}/86\text{Sr}$, continental weathering, Early Cambrian, Three Gorges, drill-core