

Euxinic conditions at Three Gorges area as opposed to global oxidation event, around PC/C boundary

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It is widely accepted that the Neoproterozoic was a transitional period to modern Earth in terms of oceanic redox condition. Some geological evidences, including carbon and sulfur molybdenum isotopic data, support this idea, and fossils of large multi-cellular animal have been discovered from Neoproterozoic strata throughout the world. In contrast, some of the fossils were discovered from anoxic sediments and iron speciation analyses indicate existences of ferruginous and euxinic conditions in some points.

Three Gorges area, South China, is one of the best places to decipher surface environmental changes during the Ediacaran and Cambrian due to the successive deposition on Yangtze platform. Our group conducted on-land drilling at the Three Gorges to collect fresh and continuous rock samples. The age range of the core samples is from the beginning of the Ediacaran to the end of the early Cambrian. I measured molybdenum concentration of the core samples by XRF analysis using glass bead. The result shows that molybdenum concentrations of organic carbon-rich black shale layers deposited at ca. 560 Ma and 525 Ma are up to 800 ppm. Same horizons contain high levels of rhenium, approaching 3 ppm, and TOC, more than 10 %. Abundant pyrites are also included in the black shale, and all of these evidences suggest that euxinic conditions occurred at Three Gorges during these periods.

In modern Black Sea, surface layer is oxic but bottom layer is euxinic because of down-welling of organic matter. As referring to this concept, euxinic conditions of Three Gorges area might imply both onset of effective burial of organic material and oxic surface layer around PC/C boundary.

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