Lithostratigraphy and organic carbon isotope stratigraphy in the lowest Triassic pelagic sequence along Kiso River, Inuyama

Hironobu Sakuma[1]; Ryuji Tada[2]; Eiichi Tajika[3]; Yuichiro Kashiyama[4]; Satoko Watanabe[1]; Shinji Yamamoto[1]; Naohiko Ohkouchi[5]; Nanako, O. Ogawa[6]

[1] Earth and Planetary Sci., Tokyo Univ; [2] DEPS, Univ. Tokyo; [3] Dept. Earth Planet. Sci., Univ. of Tokyo; [4] EPS, Univ. Tokyo; [5] JAMSTEC; [6] IFREE

In the Phanerozoic, the largest mass extinction occurred at the end of the Permian, 251 million years ago, with global loss of nearly 90% marine species. So much attention has been paid on the exact Permian/Triassic(P/T) boundary. But recently, it has been appeared that the longer period ranging from the late Permian to at least the base of middle Triassic also experienced continuous environmental instability. One of the evidences is the repetition of large carbon isotope excursions from the end-Permian throughout the early Triassic, suggesting a long-term instability of carbon cycle.

In this study, we examined the lower Triassic chert and siliceous shale sequence exposed along Kiso River, Inuyama, located in southeastern part of Mino Terrane to investigate changes in ocean environment during the early Triassic. The Jurassic accretionary complex, mainly composed of Triassic red bedded chert, are well exposed in this area, and black shale and gray siliceous shale consist of the base of this sequence. These shales are considered to be accumulated on the seafloor of Panthalassa from the earliest to early middle Triassic. However, because the strata in the accretionary complex were extensively faulted and folded, consecutive lithostratigraphy has not been reconstructed. In this study we made a detailed lithological distribution map, then constructed columnar sections for each blocks that are cut by faults, and reconstructed the consecutive lowest Triassic lithostratigraphy by splicing them. Consequently, about 9m-thick sequence was compiled, and we took samples with 20cm intervals.

Our preliminary analysis of carbon isotopic composition of sedimentary organic matter showed two large negative excursions in the lower part of the sequence. We plan further analyses of carbon isotopic composition and total organic carbon content with higher resolution throughout the early Triassic sequence to check if the organic matter in the pelagic sequence also exhibits similar isotopic fluctuations. X-ray fluorescence and diffraction analyses, with special emphasis on Si, P, Ti and Fe species, will also be conducted to examine the relationships between changes in the carbon isotopic composition, surface ocean productivity, chemical weathering on land, and deep-water redox condition.