

**Study on Mass Extinction:  
The P-T boundary and V-C boundary events**

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**【Outline of survey】**

Major mass extinctions occurred 5 times in the Phanerozoic (last 550 million years), although their causes and relevant environmental changes were not well explained yet. This project aims to clarify the cause and practical processes of the two big mass extinction events; i.e. the P-T boundary (ca. 250 m.y. ago) and V-C boundary (ca. 550 m.y. ago) events. The project comprises 1) intensive fieldstudy including drilling for unaltered rock samples, and 2) detailed geochemical analyses in laboratory by using SEM-EDS, XRF, and XRD, plus measurements of paleomagnetism and radiometric dating. Main targets include the P-T boundary rocks in central Europe, Mid-East, South China, and V-C boundary rocks in South China and Mid-East. Collected samples will be analyzed mostly in Japan for major and trace element compositions, isotope ratios of C, O, S, and Sr, paleo-magnetic polarity, and radiometric ages.

**【Expected results】**

This project will document information of Permo-Triassic sweater of shallow-sea around the supercontinent and mid-oceanic shallow- and deep-sea of the superocean for the first time. Various geochemical analyses will prove whether or not the Kamura cooling event first found in Japan was really a global phenomenon, and confirm the processes of onset and retreat of the superanoxia across the P-T boundary. Further analysis on volcanic tuff around the boundary will indicate an intimate relationship between mantle plume activity and the turmoil on the Earth's surface. These will lead the project in the later stage that aims to clarify the cause and processes of much older V-C boundary event.

**【References by the principal investigator】**

- Isozaki, Y., 1997. Permo-Triassic boundary Superanoxia and stratified superocean: Records from lost deep-sea. *Science*, **276**, 235-238.
- Isozaki, Y., 2007. Plume Winter scenario for biosphere catastrophe: the Permo-Triassic boundary case. In Yuen, D., Maruyama, S., Karato, S. and Windley, B.F. (eds.), Superplumes: beyond plate tectonics. pp. 409-440, Springer, Dordrecht.

**【Term of project】 FY2008– 2012**

**【Budget allocation】**

**102,900,000 yen** (direct cost)

**【Homepage address】**

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