# Biostratigraphic revision of extinction patterns of radiolarians and conodonts across the Triassic-Jurassic boundary in the pelagic Panthalassa

Yuki Tomimatsu*[1], Tetsuji Onoue[1], and Manuel Rigo[2]

[1]Department of Earth  Planetary Sciences, Kyushu University – Japan
[2]Department of Geosciences, University of Padova – Italy

**Abstract**

The latest Triassic (_˜201 Mya) is characterized by the end-Triassic mass extinction (ETE), which is one of the big five extinction events of the Phanerozoic. The ETE was closely linked to major perturbations of the global carbon cycle and the emplacement of the Central Atlantic Magmatic Province (CAMP). The release of volcanic and contact metamorphic carbon and sulfur gases from the CAMP is commonly invoked as the trigger for the climatic changes during the latest Rhaetian leading to the ETE. Although significant extinction events of major marine groups (e.g. ammonoids and bivalves) during the ETE interval have been reported, only a limited number of studies have reported on integrated biostratigraphic research of radiolarians and conodonts in the Panthalassa Ocean. Here, we present a high-resolution radiolarian-conodont stratigraphic distribution of an upper Norian to lower Hettangian bedded chert succession, including the Triassic-Jurassic boundary (TJB) interval in the Katsuyama-B section, Inuyama area, Mino Belt, central Japan. The bedded chert of this section was accumulated in a pelagic deep-sea environment in a low to middle latitudinal zone of the Panthalassa Ocean.The Katsuyama-B section is approximately 12.6 m thick, and consists mainly of the red and purple bedded cherts. The purple bedded chert interval (ca. 1.8 m) is intercalated in the upper part of the studied section. The biostratigraphic analysis confirmed that the radiolarian species in this section range from the TR8B (*Praemesosaturnalis pseudokahleri*) zone to the JR0B (*Bipedis horiae*) zone established by Sugiyama (1997). We also recognized three conodont zones proposed by Rigo et al. (2018) in the studied section: the upper Norian *Misikella hernsteini* zone, the lower Rhaetian *Misikella posthernsteini* zone, and the upper Rhaetian *Misikella ultima* zone. Our biostratigraphic studies revealed that some Rhaetian radiolarian and conodont faunas co-occurred with the Hettangian radiolarian fauna in the earliest Jurassic. Furthermore, our biostratigraphic analysis documented an unusually abundant occurrence of a previously unidentified *Mesosaturnalis* species across the TJB in the studied section, in a ca. 0.6 m thick stratigraphic interval. This finding suggests that this *Mesosaturnalis* species, which is highly abundant in a short interval across the Triassic–Jurassic boundary, is likely to be an excellent indicator for the TJB. Since no study of this radiolarian species has been published from the former TJB interval (e.g. Katsuyama and Kurusu sections) in Japan, the stratigraphic interval across the TJB of these sections are probably lacking.

**Keywords:** Triassic, Jurassic boundary, radiolarian, conodont, extinction, Panthalassa

*Speaker