

美濃帯の上部三畳系チャートに記録された隕石衝突，火山活動，放散虫群集変化 Meteorite impact, volcanism, and radiolarian faunal turnover recorded in the Upper Triassic bedded chert in Japan

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The Late Triassic was characterized by several marine and terrestrial biotic turnover events prior to the end-Triassic mass extinction. The causes of the end-Triassic mass extinction and Norian to Rhaetian biotic turnover events are still the subject of active debate. Catastrophic processes such as widespread eruption of the Central Atlantic Magmatic Province (CAMP) flood basalts and extraterrestrial impacts have been proposed to account for the biotic turnover events. We report a marine osmium (Os) isotope record reconstructed from an Upper Triassic chert succession in Japan, which accumulated on the paleo-Pacific deep seafloor. Os isotope data exhibit an abrupt and marked negative excursion from an initial Os isotope ratio of ~ 0.456 to unradiogenic values of ~ 0.126 in a claystone layer within the middle Norian (~ 215 Ma), indicating the input of meteorite-derived Os into seawater. A gradual decrease in $187\text{Os}/188\text{Os}$ ratios during the Rhaetian (201-210 Ma) is considered to have been closely linked with the CAMP volcanic event.

An analysis of radiolarians does not show a mass extinction event across the impact ejecta layer and during the CAMP volcanic phase. However, a significant faunal turnover occurred ~ 1 Myr after the impact event. Biostratigraphic analysis shows that 20 radiolarian species became extinct at this level and the extinction rate is estimated to be 83%. It is possible that the impact may have triggered the extinction of these 20 species, though the direct cause of their extinction remains uncertain.

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