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## Stratigraphic age of the ejecta deposit from the Sakahogi section in the Mino Terrane, central Japan

Tetsuji Onoue<sup>1\*</sup>, Honami Sato<sup>1</sup>, Tomoki Nakamura<sup>2</sup>, Yuichi Hatsukawa<sup>4</sup>, Takahito Osawa<sup>4</sup>, Toh Yosuke<sup>4</sup>, Koizumi Mitsuo<sup>4</sup>

<sup>1</sup>Kagoshima University, <sup>2</sup>Tohoku University, <sup>3</sup>Ibaraki University, <sup>4</sup>Japan Atomic Energy Agency

The Late Triassic is marked by four impact craters, including the 100-km-diameter Manicouagan crater, which is second largest impact crater in the Phanerozoic. Previous researchers suggested that these Late Triassic impact craters could be associated with an extinction event at the Triassic/Jurassic boundary or with an earlier extinction at the Carnian/Norian boundaries in the Late Triassic. In order to investigate the possible connection between the Late Triassic extinctions and the impact events, it is necessary to date the crater formation age and to find the stratigraphic record of the impact ejecta layer within a fossil-bearing stratigraphic sequence. Although, the age of the Late Triassic impact structures has been constrained by U-Pb dating, deposits containing their ejecta are known only from non-marine section in southwestern Britain.

We report that an Upper Triassic deep-sea deposit (bedded chert) in Japan, deposited within the Paleo-Pacific (Panthalassa) pelagic basin, contains microspherules, Ni-rich spinels, and iridium anomaly that are characteristic of distal impact ejecta. These indicators of extraterrestrial impact were discovered from a claystone layer in an Upper Triassic bedded chert succession of the Sakahogi section, Inuyama area, central Japan. The age of the impact-related claystone is constrained by the presence of radiolarians and conodonts. We recognized 18 radiolarian species across the claystone. The claystone layer lies between pelagic chert layers of the radiolarian zones *Capnodoce-Trialatus* and *Trialatus robustus-Lysemelas olbia*. The last occurrence of *Trialatus robustus*, which indicates the Lacian (Early Norian), is a good indicator of the ejecta deposit. *Capnodoce serisa* and *Xiphosphaera fistulata* and the co-occurrence of these taxa clearly indicate the late Lacian to early Alaunian (Middle Norian) age for the examined part of the Sakahogi section. Small numbers of conodonts from the claystone include *Mockina medionorica*, indicating an early Alaunian age (*Mockina medionorica* Zone). Therefore, the Lacian-Alaunian boundary in the Sakahogi section can be located around the *Capnodoce-Trialatus* and *Trialatus robustus-Lysemelas olbia* Zone boundary.

An analysis of microfossils reveals that the ejecta deposit occurs around the Lacian/Alaunian boundary of the Norian Stage of the Late Triassic. Although there are no radiometric age data for the Lacian/Alaunian boundary, it has been assigned an age of ~215 Ma based on the astronomically tuned geomagnetic polarity time scale. The stratigraphic age of this ejecta deposit also reveals that this impact event is not related to either the Triassic/Jurassic or Carnian/Norian boundary extinction, but its age explains significant biotic turnovers and environmental changes occurred around the Lacian/Alaunian boundary.