

Late Guadalupian(Permian) lithostratigraphy of the topmost Iwaizaki limestone in NE Japan

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To clarify environmental and biological responses to the extinction-related global change around the Guadalupian-Lopingian boundary (Permian; ca. 260 Ma), high-resolution lithostratigraphy was analyzed for the uppermost part (Unit 8) of the shallow marine Iwaizaki limestone in the South Kitakami Belt, NE Japan. Immediately above the dominant reef facies (Unit 5-7) of the Iwaizaki limestone, an interbedded limestone/mudstone unit, ca. 40 m-thick (the uppermost part of the limestone) is composed of 4 distinct subunits; i.e., Subunit 8-A of limestone-dominated alternation with nodular limestone, Subunit 8-B of mudstone-dominated alternation of limestone and mudstone, Subunit 8-C of thickly bedded limestone, and Subunit 8-D of calcareous mudstone, in ascending order. The facies of the Iwaizaki limestone, recorded its deposition in an isolated off-shore mound within a continental shelf. A patch reef developed on the mound has started to collapse during Capitanian. In the interval of the topmost Unit 7 and Subunits 8-A and 8-B, tropical shallow marine animal fossils disappeared in a stepwise manner; e.g., large bivalves (Alatoconchidae), rugose corals (*Waagenophyllum*), and large-tested fusulines (*Lepidolina*). These taxa never re-appeared in the overlying strata to the top of the Permian in the South Kitakami belt. Although the water depth frequently fluctuated, the depositional site recorded an overall deepening trend during the deposition of Unit 8, which was likely caused by the subsidence of the basement. Despite the global sea-level drop across the G-L boundary, a significant part of the Capitanian stratigraphy was preserved in the Iwaizaki limestone, probably because the relevant shelf domain subsided much faster than the global sea-level drop. The disappearance of benthic tropical animals and the collapse of a carbonate factory during the Capitanian were likely driven by the Capitanian global cooling.

Keywords: mass extinction, South Kitakami, limestone, G-L boundary, Permian