High bio-productivity Kamura event and its collapse across the G-L boundary (Permian)

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Middle to Upper Permian shallow marine carbonates in Kamura, SW Japan, were derived from a paleo-atoll complex on a paleo-seamount in mid-Panthalassa. A secular change in d13Ccarb was analyzed to document the oceanographic change in the superocean with respect to the mass extinction across the Guadalupian-Lopingian boundary (G-LB). The Upper Gudalupian is characterized mostly by unusually high positive values of +4.9 to +6.2 per mil, whereas the Lower Lopingian by low values from +1.9 to +3.5. The 4 per mil negative shift in total occurred in 3 steps around the G-LB. A remarkably sharp 2.4 per mil drop occurred in the topmost 2 m interval of the Guadalupian, after all large-shelled fusulines disappeared abruptly. Such a prominent high positive plateau followed by a large negative shift across the G-LB is first detected in the mid-superocean and is correlated with the GSSP of the G-LB in China. The present results prove that the end-Guadalupian event was doubtlessly global in context. The end-Guadalupian high positive plateau in d13Ccarb values over +5 per mil is particularly noteworthy because it recorded an unusually high bio-productivity period that has not been known in the Permian. This end-Guadalupian high productivity event, newly named Kamura event, suggests burial of a huge amount of organic carbon, draw-down of atmospheric CO2 and resultant global cooling in the late Guadalupian, considerably after the Gondwana glaciation. The low temperatures during the Kamura event may have caused the end-Guadalupian extinction of large-shelled Tethyan fusulines adapted to warm climate. The Kamura event agrees with the global sea-level curve in the Middle-Late Permian.