The Ediacaran oceanic environment: Pb-Pb isochron, REE abundance and Sr isotope ratio on the Altai limestone

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We report a Pb-Pb isochron age, Sr isotope variation, and geochemical characteristics on the Ediacaran mid-oceanic Baratal limestone which occurs as enclosed block in a Cambrian accretionary complex (Uchio, Y. et al., 2004). The beginning of the Ediacaran period is defined by the cap carbonates covering the Marinoan glacial deposits and dated on zircons as 635.5 Ma (Kaufman, 2005; Condon et al., 2005). The termination of the period is the beginning of the Cambrian (542Ma). The Ediacaran is evaluated as a cradle for the Cambrian radiation, and also the time of breakup of the Rodinia. The occurrence of the Baratal limestone gives unique opportunity in considering global oceanic environment of those days because they do not involve any terrigenous components due to isolated geographic condition from continents. But it makes it difficult to determine an isotopic age except Pb-Pb isochron method.

Judging from the present-day Mn/Sr and Rb/Sr ratios of the samples (Jacobsen and Kaufman, 1999), they seem to preserve their original geochemical characteristics. A Pb-Pb isotope analysis define an errorchron of 595+-41 Ma (MSWD: 11.9) for the samples from the whole stratigraphic succession. At present, analytical work is in progress for the samples of the same horizon. Sr isotopes show a wide variation from 0.7059 to 0.7077, that seems to correspond with the event of Ediacaran minimum of Sr isotope. In harmony with the variation of Sr isotope, REE patterns are supposed to show substantial variations. Such variations would be interpreted in terms of environmental change due to redistribution of plates : breakup supercontinent of Rodinia.