

## Eocene travertine with annual lamination in Yunnan province, south China

\*Yoshihiro Kakizaki<sup>1</sup>, Akihiro Kano<sup>1</sup>, Ke WANG<sup>1</sup>, Hongbo Zheng<sup>2</sup>

1. Graduate School of Science, The University of Tokyo, 2. Yunnan University

The Eocene Baoxiangsi Formation in northern Yunnan province is fluvial sedimentary sequence including some limestone body, for which the depositional environment and process were poorly understood. We describe sedimentary and geochemical features of the limestone exposed at a quarry near Jianchuan. Here the limestone exhibited unique sedimentary structures, such as oncoids and stromatolitic lamination.

The laminated limestone consists of light-colored and dark-colored layers that repeated in 1.5-cm intervals. The light layers appear dense micrite encrustation on filamentous microbes. The dark layers consist of coarser calcite crystals with fenestral structures indicating carbonate precipitation associated with thick biofilm development. C-O isotopes change with laminated pattern. Carbon isotopes range from +3 to +7‰, generally low in the light layers, and high in the dark layers. Oxygen isotopes range from -13 to -11‰, generally low in the light layers, and high in the dark layers.

Laminated limestone of the Baoxiangsi Formation resembles to fluvial tufas in terms of sedimentary features, but shows similar isotopic features with travertine. It was not marine carbonate. High carbon isotopic values indicate an endogenic origin of carbon. The underground water dissolving the endogenic CO<sub>2</sub> generates high concentrations of calcium through subsurface rock-water reaction. Light and dark layers correspond to summer and winter deposits. Assuming constant oxygen isotopic value of the water, seasonal amplitude of the water temperature change was evaluated around 10°C. Minor perturbations in C-O isotopes may indicate the change in water amount reflected from the change in rainfall.

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