

Chemosynthetic fossil community in Early Cretaceous methane seep from Yubari City, Hokkaido

*Nanami Shimazu¹, Robert Jenkins¹

1. Kanazawa University

Japanese archipelagoes have rich fossil record of the methane-seep communities since the Late Cretaceous, however, the Early Cretaceous record is poorly known. Thus, we have investigated the Early Cretaceous (Albian) carbonate rocks found in Utagesawa Creek, Yubari City, Hokkaido. The locality was previously mentioned in several papers, but the comprehensive approaches including sedimentary petrological, isotope geochemical and paleontological aspects haven't been done.

Many carbonate boulders were found along the creek and its size distribution along the creek suggest its single origin of outcrop. The carbonate rocks show mosaic textures mainly composed of micritic grayish patchy blocks. Bladed calcite and sparry calcite are filled in void spaces. Detailed observation revealed the micrites and the bladed calcites were precipitated in early diagenetic stages, and its isotopic compositions are -45.8 to -35.8 ‰VPDB for carbon and -25.4 to -17.9 ‰VPDB for oxygen.

The petrological and geochemical features indicate that carbonate rocks were formed under influence anaerobic oxidation of methane(AOM) due to the microbial activity in methane seep.

The carbonate rocks yield many bivalves, such as *Caspiconcha*, lucinids, *Nucinella*, solemyids, and thyasirids, and some hokkaidoconchid species.

Those molluscan species are well known from Cretaceous seeps in the world. No brachiopods were found from the locality. The fossil assemblage indicates that the Utagesawa seep was fully occupied by chemosynthetic molluscan species whereas the Early Cretaceous seeps in California are characterized to have brachiopods.

Campbell and Bottjer (1995) suggested the faunal composition has been changed mainly from brachiopods to bivalves through transition between Early to Late Cretaceous. The current study indicate the phenomenon occurred only restricted in California.

Keywords: methane seep, Early Cretaceous, Chemosynthetic fossil community