

BBG005-20

Room: 301B

Time: May 23 16:30-16:45

Microbial fossils from low-grade metamorphosed basalts in Mesozoic and Paleozoic accretionary complex in Japan

Masayuki Sakakibara^{1*}, Hisanari Sugawara¹, Tomohiro Tsuji³, Minoru Ikehara²

¹Grad. Sch. Sci. & Engi., Ehime Univ., ²Shikoku Research Institute Incorporated,

³Cent. Adv. Marine Core Res., Kochi Univ.

Metabasaltic rocks from northern Tokoro belt in eastern Hokkaido, and northern and southern Chichibu belts in central Shikoku, Japan, were found to contain fossils that indicate that subseafloor microbial life once proliferated within these rocks. They can be divided into two types based on mode of occurrences, morphology and internal structure; types I and II.

Type I textures are tubular ichnofossils and consist of tubular cavities with micron-sized diameter, filled with titanite. They were found from the Tokoro and southern Chichibu metabasalts. Type II textures occur as mineralized filaments in carbonate, quartz or pumpellyite domains. Microbial clay authigenesis analogous to the encrustation of prokaryotes in modern iron-rich environments led to the preservation of filaments. The filaments predominantly consist of iron oxide, phengite and pumpellyite. They were found from the northern Chichibu metabasalt.

Delta 13C values in calcite from fossil-bearing metabasalts range from -5.0 to 2.7 per mil in the Tokoro belt, and from -2.49 to +0.67 per mil in the northern Chichibu belt.

Biogenicity of the tubular and filamentous structures is indicated by (1) their spatial clustering (preferential occurrence), and their size and shape resembling modern microorganisms including a constant diameter along the length of curved filaments, (2) internal structure and constituent secondary minerals can be explained by recrystallization of microbial fossils, and (3) syngenicity of microbial life.

Low-grade metamorphosed metabasalts in Mesozoic and Paleozoic accretionary complex in Japan preserve subseafloor microbial fossils.

Keywords: low-grade metamorphism, Mesozoic and Paleozoic accretionary complex, metabasalts, subseafloor microbial life, fossil