

Preliminary report of YK23-05S cruise: a Shinkai 6500 dive study on the oceanic core complexes in the West Philippine Basin

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A significant fraction of the ocean floor is created in backarc basins where water plays a major role in magmatic processes, leading to an accretionary style potentially contrasting to that of normal mid-ocean ridges. A better understanding the architecture and composition of backarc basins is therefore important to understand the oceanic crustal accretion process globally. Oceanic core complexes (OCCs) or megamullions are domal bathymetric highs with axis-normal corrugations, and with exposure of serpentinized peridotite and gabbroic rocks, interpreted as exhumed footwalls of low-angle detachment faults. OCCs are often inferred to represent periods of reduced magmatism at a given section of the spreading segment, providing opportunities of understanding the oceanic lithosphere. Therefore, OCCs in backarc basins are significant study targets for understanding oceanic lithosphere globally.

Following the discovery of the Earth's largest OCC, Godzilla Megamullion, in the Parece Vela Basin, more and more OCCs have been mapped within the backarc basins in the Philippine Sea Plate, including Mado Megamullion in the Shikoku Basin. In this contribution, we will report the results of a Shinkai 6500 dive study of the OCCs in the West Philippine Basin to be conducted for the first time by YK23-05S cruise in April 2023. It has been suggested that the West Philippine Basin was generated by backarc spreading more than ~50 my ago right after the subduction initiation event along the proto-Philippine Sea Plate, via interaction of mantle plume activity, being resulted in an overall complex basin morphology with the presence of large bathymetric high of mantle plume origin (such as Benham and CBF Rises) and OCCs adjacent to CBF Rise. We are hoping that YK23-05S cruise will provide crucial information on the rocks and geophysical data from the OCCs to unveil the tectonics of the early stage of the Philippine Sea Plate evolution.

Keywords: Philippine Sea, backarc basin, oceanic core complex, West Philippine Basin, Shinkai 6500