# Amagmatic tectonics and mantle peridotites in the Philippine Sea backarc basins

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Since the so-called Miyashiro controversy, many workers have been considered that ophiolites were formed in backarc basins. The details of backarc basin peridotites, however, have not been understood at all due to lack of sampling.

In this presentation, I will show the results of the mapping study on the Philippine Sea backarc basins conducted by the Hydrographic Department of Japan, and the petrological characteristics of the backarc basin peridotites.

The samples described in this presentation are from the two backarc basins in the Philippine Sea: the Parece Vela Basin and the Mariana Trough. The former was extinct at 12 Ma and the latter is now active. In the Parece Vela Basin, mullion structures (including the Giant Megamullion) have been mapped for the first time in backarc basins, suggesting amagmatic tectonics occurred at the certain phases of the basin evolution. Mantle peridotites in the Parece Vela Basin are closely developed with these mullion structures. In the Mariana Trough, mantle peridotites are exposed on the presumed segment boundary.

The petrological characteristics of the Parece Vela Basin peridotites are, (1) the most fertile peridotites have the spinel Cr # about 0.17, falling into the most fertile end of the abyssal peridotite compositional range, (2) many have interstitial modal plagioclase, and (3) many dunites were recovered. The petrological characteristics of the Mariana Trough peridotites are, (1) the spinel Cr # about 0.25, suggesting slightly depleted character of the Mariana Trough peridotites, and (2) no plagioclase-bearing peridotites and dunite were recovered. These are the first data sets for backarc basin peridotites and thus are very important for the ophiolite communities.