

Lower oceanic crust exposure in the Shikoku backarc basin: preliminary data from the Mado Megamullion

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The Mado Megamullion (MM) in the Shikoku Basin represents an important tectonic window to understand the accretionary processes of the backarc oceanic lithosphere. Due to the easy accessibility (only ~1300 km from Tokyo) this oceanic core complex (OCC) is unique compared to the others well-studied OCCs worldwide. The rocks sampled during the 2007 and 2018 expeditions are mainly peridotites and gabbros, locally associated with minor basalts. The gabbros are deformed and undeformed varieties, the latter including varitextured and microgabbros. Most of these gabbros are fairly evolved consisting of olivine-free to oxide-rich gabbros locally intruded by felsic material resembling, whereas primitive lithologies are missing. Microtextural and chemical data are here used to show that the association of varitextured to fine-grained gabbros with felsic material resemble those of the gabbros formed at the dike-gabbro transition. Hence, we preliminarily propose that the MM exposes a portion of a crustal sequence intruded into the shallow mantle.

Finally, our data indicate that covariations in plagioclase anorthite (An) versus clinopyroxene $Mg/(Mg+Fe)$ of the Mado MM gabbros form a trend notably steeper than those of abyssal oceanic gabbros. This trend mirrors that of the lower crust from the Godzilla Megamullion, a largest OCC in the Parece Vela backarc basin [1], suggesting that the so far considered peculiar composition of the Godzilla gabbros [2] can be instead typical of the crust formed in backarc basins.

[1] Ohara Y., Yoshida T., Kato Y., & Kasuga S. 2001. *Marine Geophysical Research* 22, 47–61. [2] Sanfilippo A., Dick HJB & Ohara Y., (2013). *J Pet* 54, 861–855.