

## reactivation of Median Tectonic Line and alternation in sambagawa metamorphic belt in Mie prefecture

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The Median Tectonic Line (MTL) is the largest fault in Japan. It extends in southwest Japan, trends ENE-WSW and dip north at moderate angle. Boundary of the MTL in the Kinki region consists of the Cretaceous Ryoike granitic rocks and Jurassic Sambagawa high-P/T metamorphic rocks. At the Ichinokawa phase (around the Paleogene) the Sambagawa metamorphic rocks seems to have been elevated and contacted against the Ryoike granitic rocks.

In Matsuzaka city (Mie prefecture), a large outcrop named Tsukide Outcrop exists (Suwa et al., 1997). Tsukide Outcrop has no fault gouge along the MTL, and in the past Muscovite K-Ar dating has not been conducted, however, in 2017 the dating was conducted for the gouge found at ~600 m west of Tsukide Outcrop (MTL gouge), resulting in a K-Ar age of 11.2-11.7 Ma. In this study we researched the effects of the reactivation of MTL on the surrounding area at ca. 11 Ma.

The MTL gouge exist at the fault boundary between the cataclased Ryoike granitic rocks and the Sambagawa metamorphic rocks with the width of ~7 cm. The field research in the area ~30m south from the outcrop including the MTL revealed the existence of various but mostly ENE-WSW-trending north-dipping faults, EW-trending north-dipping schistosity and quartz veins subparallel to the schistosity. Next, We collected samples of the MTL gouge, fault gouges except the MTL gouge (fault gouge) and non-gouge Sambagawa metamorphic rocks (host rocks), then X-Ray analysis were conducted for the samples in order to determine mineral composition. The result shows the variety of mineral composition, which may be caused as a result of the hydrothermal alternation, but no difference of the composition of clay minerals has been found in the samples depending on weather they are from gouges or host rocks. On the other hand, The XRD analysis for oriented clay-sized mineral samples results large amount of illite-smectite mixed layer only in the MTL fault gouge, while other fault gouges and host rocks have (almost) no smectite. Illite crystallinity (Küber Index) was  $\sim 1.0^\circ \Delta 2\theta$  for the MTL fault gouge, and 0.2-0.4  $^\circ \Delta 2\theta$  for else. These results suggest that the activity of MTL could be promoted due to the existence of smectite, which reduces a coefficient of friction in a fault. Also, a trend was seen in which gouges in high-angle faults have lower illite crystallinity than that of host rocks or gouges in low-angle faults. The reactivation of MTL seems to have induced forming / activating of small faults in the Sambagawa metamorphic rocks, especially the high-angle faults, which formed the poorly crystallized illite.

Keywords: Median Tectonic Line, Tsukide Outcrop , Muscovite K-Ar dating , Illite crystallinity