

## Asymmetrical shear fabrics of tectonic melange in the Kanayama Unit of the Mino Belt, Southwest Japan

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The aim of this study is to clarify the forming process and deformation mechanism of melange in the Kanayama Unit, the youngest tectonostratigraphic unit of the Mino terrane, central Japan. Meso- and microscopic observations suggest that the melange is mostly in tectonic origin caused by layer-parallel shear in a shallow level of accretionary prism.

Illite crystallinity analyses of mudstone matrix is performed in order to estimate the grade of metamorphism. CIS standardized crystallinity values of all samples range in the grade of diagenesis lower than 200 C. This result suggest that the melange was formed in a level shallower than several kilometers.

The melange is mainly composed of clasts of chert, siliceous mudstone and sandstone in all sizes, and abundant muddy matrix. Deformation style of clasts in the melange differed with lithological competency. Competent rocks such as chert or sandstone deformed cataclastically forming lensoidal to angular shaped clasts, and scatter into matrix. While incompetent rocks such as siliceous mudstone show ductile behavior mainly due to independent particulate flow. Mud injections often observed in many sandstone clasts. This suggests that the mudstone was poorly-consolidated and experienced abnormal pore fluid pressure, which triggered brittle fracturing of surrounding beds during the earliest stage of deformation process.

Layer-parallel, non-coaxial shear dominated in the next stage, and resulted in the formation of scaly cleavages in the mudstone matrix. Some rounded sandstone clasts in this type of melange preserve the pre-existing, mud-injection fabrics. S-C like fabrics as those in fault rocks occur in highly-deformed part where the scaly cleavages develop. Some clasts show distinct sigma structures.

These asymmetrical fabrics show sinistral shear senses systematically throughout the study area, in spite of the change of bedding attitude due to macroscopic westward-plunging folds. After unfolding about the fold axis and tilting corrections of beds assuming that the back-tilting of beds occurred before the formation of plunging folds, restored slip direction of the hanging wall of melange directed SSW on average. This direction changes into SSE after the vertical-axis, counterclockwise rotation, which restore to the original position of Southwest Japan before the opening of the Sea of Japan during the Miocene.

Radiolarian and K-Ar dating data give us the timing of accretion at the Early Miocene around 125-133Ma. The melange formation is believed to be intimately related to this accretion. At that time, the NNW moving Izanagi Plate subducted beneath the eastern margin of the Asian continents. Hence, the slip direction obtained from the melange fabrics of the Kanayama Unit is conformable with the regional-scale plate reconstruction.