Paleothermal structure of the Mugi melange, the Northern Shimanto Belt in Shikoku Island, SW Japan.

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Northern Shimanto Belt in the eastern Tokushima area (east side from the R193) is divided into two paleothermal structural units - northern and southern - (hereafter, PSU) using by vitrinite reflectance study (Mori and Taguchi, 1988; Ohmori et al., 1997). PSU boundaries (almost correspond to the Fukase fault and Aki Tectonic Line in this area) are mega-scale out-of-sequence thrusts (OST) formed at the final stage of growth processes for an accretionaly complex.

Recently, we are assumed that melange units in an ancient accretionray complex were formed at seismogenic zone in a subduction zone and investigate Mugi melange in detail as a fossil of seismogenic zone (Kimura et al., this volume). As a result of a detailed geological survey, we found that Mugi melange is an underplated tectonic melange and divided into five thrust sheets formed by restored oceanic stratigraphy. We named them Unit 1 to 5, from the south to the north (bottom to top), respectively. Vitrinite reflectance study is carried out around Mugi area as a part of P-T-t pass analysis for this project. Mugi melange is belongs to Southern PSU. 51 sandstone or mudstone samples were collected from eastern Mizuochi, Furumugi area and Ozuna beach along the coast, and excellent data were obtained from 20 samples (Measurements were carried out at Kochi Univ. Non-polarized light was used.). We succeeded in obtaining continuous data from the Hiwasa to the Kainan Formation through whole part of the Mugi melange. Additionally paleothermal structure was examined in detail together with existing data of the region in the surrounding (Ohmori et al. 1997; polarized light was used).

Trend of thermal structure is explained from the north to the south. Ro data of the Akimaru Melange and the Hiwasa Formation show about 2 percents (Akimaru area). There is no remarkable difference in Ro near a boundary between the Hiwasa Formation and the Mugi melange, 2.6 percents about. In the tectonic thrust sheet 5 and 4 in Mugi Melange, Ro gradually increase from 2.5 to 3.1 percent southward (~265 degrees C, Barker, 1988). Ro increases from Akimaru area gradually toward the Bottom of unit 4. However, in the tectonic thrust sheet 3, Ro suddenly decrease to 1.0 percents (150 degrees C). In the tectonic thrust sheet 2 (Ro = 1~1.1percents) and unit 1 (1.5percents; 148C~190 degrees C) also show lower value in Ro. In addition, Ro value for the Kainan Formation has increased from the same level as unit 1 to 1.6percents.

As a result, five structural thrust sheet units of the Mugi melange divided in two groups according to the paleothermal structure. At the boundary of unit 3 and 4, there is difference in experienced paleomaximum temperature more than 100 degrees C. This PSU boundary fault is corresponding to Mizuochi Fault (Nakagawa et al., 1977). It is thought that this fault is continual at least from east to west at about 5km, however, it doesn't continue with mega-OSTs, the Fukase fault and the AKI Tectonic Line. Moreover, there is a possibility that another PSU boundary is exists about 3km north of this boundary. The southern PSU is divided into three sub-scale-paleothermal units further by such a small scale OSTs. These OSTs could be branches of mega-OST, Aki Tectonic Line.

At least, in the view of paleothermal structure, Mugi melange zone came from two depths. It is possible that two melange units join into one melange zone after overprinted event for paleothermal structure. It is very important that two melange units (high and low temperature units) are growth at same depth or not. Stacked five thrust sheets in present are not a same series. It will be necessary to put this difference on the mind and discuss the melange formation process in the future.

Though this is subsidiary data, Paleogene radiolarian fossils substituted for pyrites obtained from green gray shale in thrust sheet 1. This data will change the distribution of A.T.L. as a geological age boundary.