

Kinematics and K-Ar geochronology of the Median Tectonic Line of western Shikoku, south-west Japan.

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For the long time span of the Paleogene period (66-26 Ma), the fault movement along the MTL (Median Tectonic Line) has not been fully clarified. Kubota and Takeshita (2008) inferred that Paleogene kinematic history of the MTL is divided to 63-58 Ma (Ichinokawa phase) and 45-25 Ma (Pre-Tobe phase). Based on the deformation structure along the MTL of map, outcrop, and section scale, our study indicates that Ichinokawa phase is the large scale normal faulting of MTL(Kubota and Takeshita, 2008), and Pre-Tobe phase is the left lateral slip and top to the south of faults parallel to the trend of the MTL, the Okamura, Kawakami, Shigenobu, and Iyo Fault, and northern part of the MTL in the western Shikoku (Kubota and Takeshita, 2015). Kinematics of the MTL in Paleogene is gradually elucidated, however it is necessary to study more detailed the movement periods. Previous studies, the K-Ar age measurements of fault gouge along the MTL show peaks of ages at ca 60Ma (e.g. Shibata et al. 1989) , but there is little of a measurement showing the multiple movement phase.

The purpose of this study is to date the fault movements, it carried out that the K-Ar age measurements of fault gouge sampled at area avoided overlapping deformation of movement phase divided by the investigation of map, outcrop, and section scale. The measurement object intends for authigenic illite produced by the fault movement. The problem of this measurement method is that it is difficult to separate only authigenic illite from sample, because it consists of detrital illite in samples of fault distributed in wall rocks of sedimentary rock. Therefore, the measurements are the mixed age and become the measurements that are older than the age of the fault movement. We are going to estimate the true age of fault movement by analyzing the polytype. In addition, it intend to analyze the change of ages by the particle size and the polytype quantification based on dating of illite of 3 fraction (0.2-0.4, 0.4-1.0, 1.0-2.0 μ m) for 1 sample. It shows result of the K-Ar age measurements before the analysis of polytype (Table1). Based on the K-Ar age measurements, it is expected to understand the periods of Ichinokawa phase and Pre-Tobe phase in more detail.

Kubota, Y., Takeshita, T., 2008. *Island Arc*, vol. 17, p.129-151.; Kubota, Y., Takeshita, T., 2015. *The 122nd annual meeting of the geological society of Japan abstract*. p.125.; Shibata, K., Nakajima T., Sangawa A., Uchiumi S. & Aoyama H., 1989. K-Ar ages of fault gouges from the Median Tectonic Line in Shikoku. *Bulletin of the Geological Survey of Japan* . 40, p.661-671.

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Table 1 Result of K-Ar dating

	Sample No.	Mineral	Grain size (μm)	K content (wt.%)	Rad. ⁴⁰ Ar (10 ⁻⁸ cc STP/g)	K-Ar age (Ma)	Non-rad. ⁴⁰ Ar (%)
Okamura Fault	OK-1-A3	illite	0.2-0.4	5.886 ± 0.118	1054.6 ± 11.3	45.6 ± 1.0	9.0
			0.4-1.0	5.822 ± 0.116	1069.7 ± 11.5	46.7 ± 1.0	8.1
			1.0-2.0	5.562 ± 0.111	1046.2 ± 11.0	47.8 ± 1.1	7.6
	OK-1-A5	illite	0.2-0.4	4.927 ± 0.099	791.7 ± 10.0	40.9 ± 1.0	19.5
			0.4-1.0	4.900 ± 0.098	794.0 ± 9.8	41.3 ± 1.0	18.9
			1.0-2.0	4.871 ± 0.097	802.0 ± 9.8	41.9 ± 1.0	18.5
Shigenobu gawa F.	SG-2-A3	illite	0.2-0.4	5.990 ± 0.120	1410.0 ± 15.3	59.7 ± 1.3	9.5
			0.4-1.0	5.620 ± 0.112	1453.6 ± 15.4	65.5 ± 1.5	8.0
			1.0-2.0	5.149 ± 0.103	1403.9 ± 14.9	68.9 ± 1.5	7.4
Kawa kami F.	YY-1-A4	illite	0.2-0.4	5.917 ± 0.118	1589.7 ± 16.3	67.9 ± 1.5	4.6
			0.4-1.0	5.415 ± 0.108	1592.4 ± 16.3	74.2 ± 1.6	4.8
			1.0-2.0	5.046 ± 0.101	1485.5 ± 15.3	74.3 ± 1.6	5.5
MTL	YA-1-A1	illite	0.2-0.4	6.495 ± 0.130	1288.0 ± 13.4	50.4 ± 1.1	6.3
			0.4-1.0	6.229 ± 0.125	1336.5 ± 13.9	54.5 ± 1.2	6.2
			1.0-2.0	6.080 ± 0.122	1327.5 ± 13.7	55.4 ± 1.2	5.9