

Active tectonics and evolutionary processes of the eastern part of Oiso Hills inferred by depositional environments of gravel layers, central Japan

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Oiso Hills is an uplift block bounded by active faults and uplifted rapidly in the last Quaternary period (Active Fault Research Association, 1991). In the eastern part of Oiso Hills, there are some active faults. Their continuity is not clear enough because of their complex geological structures (Kaneko, 1971; Mizuno, 2016). We tried to clarify the active tectonics in this area based on the depositional environments of gravel layers and the paleo-geography, reconstructed by analysis of the Pleistocene Kissawa Formation (KF). Firstly, we examined the present Kaname riverbed gravels and Sagami Bay beach gravels. Secondly, we analyzed gravels in KF. Finally we tried to estimate the evolutionary processes of the eastern part of Oiso Hills.

We established a frame of 1m×1m at each gravel sampling site along Kaname River, and the Sagami bay beach, and collected 100 gravels. We also collected 100 gravels from an outcrop within the frame of 1m×1m. Sampling sites were shown in figure 1. We measured the diameter, roundness, degree of weathering, sphericity, and lithology to estimate transportation processes (Sneed · Folk, 1958).

The gravels of Kissawa Formation showed the, average diameter, roundness, sphericity of about 2cm, 0.6, 0.7, respectively.- a ratio of mudstone was high subsequently a sandstone, a chart excelled.

Average diameter of the Kaname River gravels decreased downstream from around 8cm to around 3cm, and average roundness increased from 0.3 to 0.6. Average sphericity was around 0.7. In gravel species, pyroclastic rocks occupied the majority upstream, and the ratio of sandstone, mudstone, and conglomerate increased in the downstream.

The average diameter of the Sagami Bay beach gravels was around 2.5cm, average roundness was around 0.7, and average sphericity was 0.6, only in the west of the eastern part of Oiso Hills was around 0.7. In gravel species, a sandstone and mudstone excelled, and ratios of mudstone increased towards the west from the Kaname River mouth.

Because mudstone gravel is dominant in KF, and because the average diameter of the gravels of K-F is almost the same as that of the beach gravels, it is more likely to be marine.

Reference: Kaneko S. (1971) Journal of The Geological Society of Japan, Vol. 77, No. 6, p. 345-358. Active Fault Research Association (1991) University of Tokyo Press, p. 4. Machida · Moriyama (1968) vol. 41, No. 4, p. 241-257. Mizuno (2016) No. 71, p. 153-160. Sneed ED · Folk RL (1958) Journal of Geology, Vol. 66, No. 2, p. 114-150.

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