

Chronology of fluvial terraces and development of landform in and around the Sekigahara region, central Japan

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The Sekigahara region is situated at the center of the northeastern margin of the Kinki Triangle (Huzita, 1962). This margin consists of thrust faults in the southern part and strike-slip faults in the northern part. There are both types of faults in the study area. Therefore, fault distribution is more complex and irregular than the southern and northern parts. Active faults in this study are the Kajiya fault, Daigo fault, Ohshimizu fault, Sekigahara fault, Monzen fault, Miyashiro fault, Tarui fault and Ikeda-yama fault. The NW-striking faults are mainly left-lateral strike-slip faults with northside uplift, while the N-striking thrust faults are also observed. In terms of average slip rate, quantitative discussions were done only on the Miyashiro fault and Ikeda-yama fault. Additionally, chronology of fluvial terraces has hardly been made almost in the study area due to the rarity of key tephra. Thus, further investigations are necessary to fully understand the fault activities of this study area and development of landform.

This study has three aims. First is to pursue chronology of fluvial terraces. Second is to estimate average slip rate of each active fault. Third is to reveal the development of landform.

In this study, aerial photograph analysis, field surveys and laboratory methods were carried out to describe fault topography and interpret geomorphic development. Terraces were classified into 8 groups (H1-L4) by analysis of aerial photos. And geomorphic distribution and fault topography were revealed. During field surveys, boring of loam covering terrace deposits and measurements of displacement topography were done. Tephra analyses of loam and terrace deposit are conducted in the laboratory and key tephra, K-Ah (7.3 ka), AT (26-29 ka), and K-Tz (95 ka) (Machida and Arai, 2003) were detected.

The principal conclusions of this study are:

1) Key tephra (K-Ah, AT, K-Tz) were detected in loam and terrace deposits. Terrace surface ages were deduced from terrace deposits, key tephra and geomorphological expressions as below—H1: more than 200 ka, H2: 140-160 ka, M1: 100-130 ka, M2: 50-70 ka, L1: 20-30 ka, L2: 15-20 ka, L3: 10-15 ka, L4: 0-10 ka.

2) Average slip rate of each active fault was estimated as below—Kajiya fault: (h) more than 0.5 mm/yr, Daigo fault: (v) more than 0.1-0.2 mm/yr, Ohshimizu fault: (v) 0.1-0.4 mm/yr, Sekigahara fault: (h) 1.0 mm/yr, (v) 0.1 mm/yr, Monzen fault: (v) less than 0.1 mm/yr, Miyashiro fault: (v) 0.4-0.6 mm/yr, Tarui fault: (v) 0.1-0.3 mm/yr, Ikeda-yama fault: (v) 0.5-0.6 mm/yr (Max. more than 1.3-1.7 mm/yr) ((h): horizontal slip rate, (v): vertical slip rate)