Geomorphology and Geology of the area between Ushikubi and Saotomedake Fault, central Japan

Ryosuke Doke[1]; Akira Takeuchi[2]

[1] Dept. Earth Sci., Univ.Toyama; [2] Grad. Sch. Sci. Eng., Univ.Toyama

Ushikubi Fault, NE-SW trending about 60 km long, is one of the main faults of Atotsugawa right-lateral strike slip Fault System located northern part of central Japan. Saotomedake Fault is located northeastern trending extension of the Ushikubi Fault. This fault is about 10 km long right lateral strike slip fault (The Research Group for Active Faults, 1991), although Nataka and Imaizumi (2002) was not recognized this fault for the active fault. Some reserchers described these two faults are a series of same fault, and called Ushikubi Fault (e.g. Takemura and Fuji, 1984). Joganji River, streaming toward west on the area between these two faults, is one of the steepest river in Japan, whose undermining rate is about 3-7 m/ky. It is difficult to trace the fault in geomorphologicaly, because the big erosion rate of the river and some of the landslides. This study discusses the possibilty of the northeastern extension of the Ushikubi Fault, from the survey of the geological structure in the area of eastern edge of the Ushikubi Fault.

Geology of the eastern part of Ushikubi Fault consists to the Jurrasic Funatsu Granite Rocks, intruded to the Hida metamorphic rocks, and overlaying Tetori Group. Funatsu Granite Rocks and Tetori Group are contacted by the Ushikub Fault in the major part of eastern part of the fault. Trends of the Teteri Group indicate NE-SW to E-W, dipping 10-60 degree toward north. On the major part of eastern Ushikubi fault, Tetori Group is deformed by the fault, whose trend is consistent with the NE-SW trending Ushikubi Fault and steeply inclined nearby the fault. The degree of the deformation is too small to trace northeast of the fault, and attitude of Tetori Group is EW/30N around Kamegai village, that is inconsistent with the trend of the fault.

Around Kamegai village, located along the branch of Joganji River, Wada River, outcrop of the active fault was recognized, and the Shomyodaki Pyroclastic flows (120-130 ka) and Hida Metamorphic Rocks is contacted by the fault at the northeast of the outcrop (Doke and Takeuchi, 2006). At the Omi village, located 1 km north from Kamegai village, the outcrop of the fault, trending N60E, composed of boundary of Tertiary Iwaine Formation and Tetori Group. Although this outcrop is not extend to the outcrop at Kamegai village, it is located the extension of previous fault trace (The Reserch Group for Active Fault, 1999; Nakata and Imaizumi). If the outcrop was the extension of the Ushikubi fault, it has possibilty of the branch structure of the edge of the strike slip fault. However, it has possibility that the outcrop is not extension of the Ushikubi Fault, but the extension of paralleling geologic fault.

Strictly speaking, the Saotomedake Fault is not located trending extension of the Ushikubi Fault. Relationship of these two faults is right stepping, and the structure cause to make extentional zone between two faults, that is, the pull-apart basin. Some of circumstantial evidence supporting this hypothesis is observable. The vally of Joganji River between two faults is wider than lower and upper stream. At the era falled AT tephra, the environmental around the area was lucustrine (Machida and Arai, 1992), and Change of the route of Joganji River was happened after the era of AT tephra. The distribution of Shomyodaki pyroclastic flows is stopped around Kamegai and Omi village, whose thickness is about 200m, and the flows are not distributed lower stream from these villages.

Tsukuda (1991) named this style of stepping to Extensional Barrier, and indicated that the rupture of fault is stopped at the Extensional Barrier. Additionally, because the deformation of Tetori Group is ended at the northeastern edge of the Ushikubi Fault, it is considered that the Ushikubi and the Saotomedake Fault belong to another segment.