

The activity characteristics of Mozumi-Sukenobu fault, Atotsugawa fault system, central Japan

baator Has[1], Akira Takeuchi[2], Akimitsu Takebe[3]

[1] Earth Sci., Toyama Univ, [2] Dept. Earth Sci., Toyama Univ., [3] Mindeco

Mozumi-Sukenobu fault (MSF) is a member of Atotsugawa fault system, runs southwest to northeast, subparallel to the master Atotsugawa fault (ATF). Since 1997, we made geological and geomorphological investigation along the surface trace of the MSF. The results of these investigations revealed that MSF is a dextral strike-slip fault with southern side uplifting. An excavation was conducted at 200m east to Mozumi Pass, 1998, clarified the activity history of MSF. An average reoccurrence interval of 9,000years was obtained in this excavation. This interval for MSF is significantly longer than that for the master fault of ATF. According to the geological and geomorphological investigation, it seems that the highest activity of MSF is probable in the central part around the Sukenobu Lake.

Along the northern margin of the Hida Highland, there is a series of dextral strike-slip faults, the Atotsugawa fault system (AFS). The faults of this system, subparalleling each others with strikes of NE-NNE and extending 60-70 km, show geomechanical relationship conjugated with Atera fault system in central Japan, which extends a trend of NW-SE, with left-lateral strike-slip sense of faulting.

A five-year project for comprehensive study of the AFS started in April 1996 as a part of "the Frontier Research for Terrestrial Subsurface" conducted by the Science and Technology Agency, Japan. In 1997, we conducted geological and geomorphological investigations at the western part of the MSF. Many fracture zones and tectonic deformation of landscapes were found along the fault trace in this part, which indicate dextral strike-slip displacement with southern side uplifting. A tectonically deformed gravel layer was observed at the left bank of Nagato River, shows a vertical displacement with southern side uplifting by about 2m. In 1998, we performed an excavation survey across the surface trace of MSF at a fault notch, 200m east to Mozumi Pass. Four or more faulting events were estimated according to the deformation of sediments along the fault plane. The event-4 occurred between 26,890 y.B.P. and 26,830 y.B.P., event-3 and event-2 occurred between 16,540 y.B.P. and 13,290 y.B.P. and the event-1 occurred after 310 y.B.P. .

In 1999, we conducted geological and geomorphological survey at the central part and eastern part of MSF. A newly formed fractured fault zone was found at the Ashitani valley, northeast of Sukenobu Lake, and other fracture zones and tectonic deformed landscapes around the Sukenobu Lake. All of these tectonic micro-topographies and fractured zones are indicate that MSF is extending continuously from SW to NE along the surface trace.

To summarize the survey along MSF, our conclusion is as follows:

- 1) MSF is a dextral strike-slip fault with a dip-slip component of southern side uplifting. It extends almost straightly from the Takahara-gawa river to the Higashi-Sakamori-dani valley of the Wada river with a strike of southwest to northeast.
- 2) Distribution of averaged slip rate of horizontal dislocation along MSF varies place by place through the whole trace. It seems that a highest rate is probable in the central part around the Sukenobu Lake.
- 3) The averaged recurrence interval of MSF is about 9,000 years in recent 27,000 years, based on the results of excavation at Mozumi Pass.
- 4) The latest event of MSF is correlatable to the Hida Earthquake occurred in 1858.
- 5) MSF and ATF might join underground according to the neighborhood or branching relation of the two faults on the ground surface.