

Development of thrust and topographic evolution along the western foot of the Mahiru Mountains Northeast Japan

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The Ou Backbone Range strikes northward through the central northeastern Japan arc and its central part is bounded on both sides by two active reverse fault zone, the Western margin of the Kitamami lowland fault zone and the Eastern margin of the Yokote basin fault zone. In this area, Ou backbone range is divided two elliptical mountains, the Mahiru Mountains (east side) and the Waga Mountains (west side) and there is the Yuda basin between those. Nakajima et al. (2000) inferred that Waga Mountains have been uplifted earlier than the Mahiru Mountains. Along axial part of the Mahiru Mountains, the Mt. Waga-dake, Mt. Mahiru-dake, etc., located in and extend to NNE. In addition, elliptical mountains developed around the Shiraiwa-dake at western side of the Mt. Waga-dake in the north part of the Mahiru Mountains.

We discussed about the relationship between the geometry of faulting and geomorphic features of the Mahiru Mountains like above based on a data from several disciplines including high-resolution seismic reflection profiling, tectonic geomorphology and structural geology. The Eastern margin of the Yokote basin fault zone is recognized two major tectonic zones. One is range-bounding fault named the Kawaguchi fault, and another is frontal active fault that bounded basin and foothills, named the Shiraiwa, Ota, and Senya faults. Obtained seismic images show the faulting geometries. The inferred development processes of each fault, based on seismic images and its interpretation, are considered to have changed greatly on the boundary of the Kawaguchi River that situated between the Senya fault and the Ota fault.

Furthermore, the intrusive rocks are distributed from near the Kawaguchi fault toward NE, and it associated with the geological fault that extends along the eastern fringe of Mt. Shiraiwa-dake. The Shiraiwa fault which activity affect uplifting of the Mt. Shiraiwa-dake is derived from the geological fault. The topographic relief of the Mahiru Mountains reflected in the fault geometry.