

Long-term activity and paleoseismicity of the Warikurayama fault along the southeastern foot of the Mahiru Mountains, no

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We conducted geological and topographical surveys of the Warikurayama fault along the southeastern foot of the Mahiru Mountains in northeast Honshu, Japan, to examine its structure, long-term activity and paleoseismicity. We confirmed that the fault is a reverse fault of 17 km-long. The fault having a 5 km-long south-central section, which is predominant in reverse fault component, and 9 km-long northern and north-central, and 3 km-long southern segments predominant in flexure component. A cumulative vertical displacement along the fault shows bow-shaped distribution up to 1,100 - 1,400 m since the late Pliocene or early Pleistocene. Terrace surfaces in the middle to late Pleistocene and Holocene are also cumulatively deformed and faulted along the 11 km-long central section of the fault. Terrace surfaces of 20 ka and 30-35 ka show about 4 m of vertical offset, and terraces younger than 3 ka show about 2 m of vertical offset. We conclude that the Warikurayama fault is a single behavioral segment, which has ruptured twice since 20 ka with 2 m of vertical slip per event. The most recent event of the fault probably occurred after 3 ka, and possibly in 16th century or later. An average slip rate of the fault since the late Pliocene or early Pleistocene is 0.5 to 0.9 m/ky or larger, whereas the slip rate since 30-35 ka decreases at 0.1m/ky.

Keywords: Mahiru-sanchi Toen fault zone, active fault, long-term slip rate, slip per event, paleoseismicity, 1896 Rikuu earthquake