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

AWATA, Yasuo1*, Masahiro Miyawaki2, Masaru Saito2

1 Geological Survey of Japan, AIST, 2 Dia Consultants Co. Ltd.

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 0.1 m/ky.

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