Paleoseismic event of the Hinagu segment of the Hinagu fault zone investigated by a trench survey

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Hinagu Fault zone is extending from Kiyama in Kamimashiki District, Kumamoto Prefecture to the southern part of the Yatsushiro Sea. The direction of this fault zone is generally in the northeast - southwest and which forms a distinct topographic boundary between the eastern margin of the Yatsushiro plain and the Kyushu mountainous region. The fault movement is regarded as a right lateral strike fault with relatively uplifting of the southeast mountainous side of the fault. From the activity history, this fault zone is divided in three segments, from north to south, Takano-Shirahata segment of 16km in length, Hinagu segment about 40km, and Yatsushiro Sea segment (Earthquake Research Promotion Headquarters, 2013).
During the 2016 Kumamoto Earthquake, the Takano-Shirahata segment was moved at the begging and the rupture propagated to the Futagawa fault zone in contact with the northern end of this segment. Relatively small aftershock (M<5.5) were occurred within the Hinagu segment, however the magnitude is significantly smaller than the expected earthquake which is M7.5 by using the Matsuda’s empirical equation (1975) (Earthquake Research Promotion Headquarters, 2013), this indicated that the fault rupture has not been propagated to the Hinagu segment. Therefore, we conducted a trench and boring survey at Minamibeta area in Uki City to investigate the palaeoseismic events at around the central portion of Hinagu segment.
At this location, boring survey (Nuclear Power Engineering Corporation, 1998; Kumamoto Prefecture, 1998a, b; Geological Survey of Japan, 2007) and trench survey (GSJ, 2007 and Yoshioka et al., 2007) have been conducted, although clear faults were not observed on the trench wall. But the lower formations in the trench were inclined to the west direction due to the deformation caused by the fault activity, and they estimated that there was at least one event between 11,000 to 3, 900 years ago, and no fault activity was recognized after 1,800 years ago from the age of the undeformed strata (Yoshioka et al., 2007).
In this research, we dig a trench at a position adjacent to the south side of the trench reported by GSJ (2007) and extending further to the west direction. A clear reverse fault dipping to southeast was appeared on the trench wall and the large-scale flexure of formations was observed around the fault surface. This trench survey is still continuing at the time of the submission of this abstract, and the detailed activity history of the Hinagu segment at the Minamibeta area will give a presentation on that day.

Keywords: Hinagu fault zone, Hinagu segment, Trench survey