

Distribution and characters of faults in the eastern Nanbu town and Houki town, Tottori Prefecture, western Japan

*Tatsuya Sano¹, Hideto Uchida¹, Masaki Oku¹, Takeshi Nagira, Hideki Mukoyoshi¹

1. Department of Geoscience Interdisciplinary Graduate School of Science and Engineering, Shimane University

The 2000 Western Tottori earthquake occurred in a place where no clear active fault was identified because fault system in this area is presumably younger than another active faults. Previous study revealed development of more than 1000 WNW-ESE and NE-SW trending faults with very thin fault gouge in the aftershock area and adjacent outer area of the 2000 Western Tottori earthquake. However similarity and difference of distribution and characteristics of faults between in the aftershock area and the outside area was not well understood.

The objective of this study is to reveal the distribution and characters of faults which developed outside of the aftershock area of the 2000 Western Tottori earthquake by field survey and detailed observation of outcrop of faults and thin section.

This study area is located in the eastern Nanbu town and Houki town, Tottori Prefecture, which is located eastern outside of the aftershock area of the 2000 Western Tottori earthquake. In this area, the Late Cretaceous to Paleogene granitic rocks called the Neu Grenitic Pulton is widely exposed. The granitic rocks mainly consist of coarse-grained biotite granites and aplitic-pegmatitic granites. The western part and northeastern part of this study area, porphyritic biotite granites, and Pliocene olivine basalts and Pleistocene river terrace sedimentary layer is exposed respectively. Basalt-andesite dikes, rhyolite dikes, and aplite is intruded into the granitic rocks.

Fault orientation is generally concentrated in the N84°E82°N and N45°W77°N at the western area, N66°E78°N, N88°E90° and N70°W88°N at the central area, N68°W88°N at the east central area and N32°W86°N at the eastern area. Numerous whitish fault gouge were observed at the western and center area and most of faults in the east central area contains pinkish fault gouge. Thick damaged granite zone is also observed at the western area. The damage zone consists of hydrothermally altered cataclasite matrix with clasts of host rocks which are oriented in a certain direction. The damage zone have been formed by development of NE trending faults. Thickness of these NE trending fault is less than 1cm. Some NW trending faults with 2cm thick cut the NE trending faults. Arrangement of NE trending fault in center area is also observed.

Fault orientation in western and central part of this study area is similar with those of aftershock area and fault orientation in eastern part of area is similar with Komachi-Ohdani lineament. Color of fault gouge in western and central part of this study area is similar with those of aftershock area of 2000 Westtrtn Tottori earthquake. In contrast, those of eastern part of area is similar with color of out of aftershock area which is revealed previous study. Therefore, fault system in western and central part of this study area is related to fault system in aftershock area. Fault system in eastern part of area related to Komachi-Ohdani lineament. Fault system in the 2000 Western Tottori earthquake expand 7km from epicenter in cross aftershock distribution. Western and central part of area may affected by the "Sanin shear zone".

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