Deformed minor structures in the Soeda Granodiorite at the area beside the Kokura-Tagawa Tectonic Line, Kyushu

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The Kokura-Tagawa Tectonic Line (KTTL) divides the Cretaceous granitoids in the north Kyushu into the western main granitoids and eastern granitoids. The timing and mode of activity of the Kokura-higashi Fault, northern part of the KTTL, is well studied by topographical investigation and trenching study. However, the mode of movement of the Tagawa Fault, southern part of the KTTL, has not been revealed because of few reports. The Soeda Granodiorite is distributed in Soeda Town, southeastern Fukuoka Prefecture. The Tagawa Fault is passing through the western area of this body. Thus, deformed structures, which formed by faulting of the KTTL, have been preserved in the Soeda Granodiorite. To grasp change of activity of the Tagawa Fault, we analyzed deformation history of the Soeda Granodiorite at the area beside this fault using deformed minor structures.

The Soeda Granodiorite is medium-grained granodiorite with hypidiomorphic granular texture, and is composed mainly quartz, plagioclase, K-feldspar, biotite and hornblende with accessory apatite, zircon, titanite and opaque minerals. This body is composed of massive and foliated facies. Many microcracks and minor faults exist in the area beside the Tagawa Fault. They are divided into the green minor fault, microcrack 1, reddish brown minor fault, white minor fault, and microcrack 2 by its color and crosscut relationships. The green minor fault involves fault rock comprising of chlorite, epidote, quartz, plagioclase and hornblende. The microcrack and reddish brown minor fault cut this. The microcrack 1 breaks grains of quartz, plagioclase and K-feldspar. This cuts the green minor fault, and is cut by the reddish brown minor fault. The reddish brown minor fault is involving fault rock comprising of quartz, plagioclase, hematite, goethite and rhodchrosite. This fault cut the green minor fault and microcrack 1, and is cut by the white minor fault and calcite vein. The white minor fault involves calcite and quartz vein, and partially siderite and ankrite. This shows sinistral displacement sense. The white minor faults involving thick calcite vein are shown near the Tagawa Fault. The microcrack 2 is shown in the neighborhood of this minor fault.

The deformation history in this area is divided into the following deformation stages, 1: formation of the green minor fault, 2: formation of the microcrack 1, 3: formation of the reddish brown minor fault, 4: formation of the white minor fault and microcrack 2. It is thought that the main activity of the sinistral Tagawa Fault was before the Late Miocene (Hikosan collaborative research group, 1992) or Eocene (Sakai and Watanabe, 1986). The deformation stage 4 corresponds to main active time of the Tagawa Fault.