

## Geology and petrology of the Hitokabe pluton, Kitakami Mountains

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Hitokabe pluton is distributed in the southern part of Kitakami Mountains, consisting of Early Cretaceous granitic rocks. Adakitic rocks were identified in the Hitokabe pluton (Tsuchiya et al., 2007). Adakitic rocks are considered to be derived from partial melting of young and hot oceanic crust subducted at convergent plate margins, and are characterized by unusual chemical compositions (high  $\text{Na}_2\text{O}/\text{K}_2\text{O}$ , Sr/Y, and La/Yb ratios, low Y, HREE contents) (Defant and Drummond, 1990). The Hitokabe pluton is divided into main granodiorite (granodiorite~tonalite) facies and porphyritic granodiorite facies. Granodiorite facies are intruded into porphyritic granodiorite. In additions, quartz diorite recognized as mafic microgranular enclaves are included in porphyritic granodiorite. We describe geological and petrological features of granodiorite, porphyritic granodiorite, and quartz diorite by polarizing microscopy, XRF spectrometry, EPMA analysis and K-Ar dating. Major and some trace elements, determined using XRF spectrometry, indicate that porphyritic granodiorites have high Sr (>440ppm) and low Y (13<ppm). Sr/Y vs Y discrimination diagram (Defant and Drummond, 1990) are widely used to define adakite. Porphyritic granodiorites have adakitic signatures on the Sr/Y vs Y diagram. Granodiorites are plotted on the extent of Island arc ADR. Therefore, the adakitic granites occur as the central facies of zoned plutonic bodies surrounded by non-adakitic granites of the marginal facies. Quartz diorite shows high MgO, Ni and Cr. The geochemical signature means that Quartz diorite is similar to high Mg andesite occurring in Kitakami Mountains. Amphiboles of quartz diorite provides K-Ar age of  $114.5 \pm 5.7$ Ma. Several isotopic ages have been reported for the Hitokabe pluton. These range from 117 Ma (biotite K-Ar age: Kawano and Ueda, 1965) to 113-119Ma (zircon U-Pb age: Tsuchiya et al., 2007), in agreement with amphibole K-Ar age. Considering zircon U-Pb ages of Kitakami Mountains ranging from 130 to 113Ma (Tsuchiya et al., 2014), the Hitokabe pluton might be one of the youngest granite in Kitakami Mountains.

Keywords: Hitokabe pluton, Kitakami Mountains, Adakaite