Cretaceous granitic rocks of Mt. Shimizuyama in the Mt. Kurikoma Area Geopark, Miyagi Prefecture

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Introduction

Early Cretaceous Kitakami (NE) and Abukuma (SW) granitic rocks occupy Northeast Japan and are separated by the Onikobe-Yuzawa Mylonite Zone (Sasada, 1988). Mt. Shimizuyama in the Mt. Kurikoma Area Geopark is made up of Cretaceous granitic rocks. Although Mt. Shimizuyama is located to the east of Onikobe-Yuzawa Mylonite Zone traced by Sasada (1988), there are mylonitic granitic rocks in the eastern part of the Mt. Shimizuyama granitic rock body (Osawa et al., 1988), and the attribution of the body is still ambiguous. In this context, we studied the granitic rocks of Mt. Shimizuyama.

Kitakami and Abukuma Granitic Rocks

The Kitakami granitic rocks consist of adakitic and calc-alkaline to shoshonitic granitic rocks of the magnetite-series, with the zircon U-Pb isotopic age of 127-113 Ma (Tsuchiya et al., 2015) and the magnetic susceptibility (**MS**) of 500-2000*10^{-5} SI (the greatest values in the granitic rocks of Japan; Kanaya et al., 1973).

The Abukuma granitic rocks consist of non-adakitic granitic rocks of the ilmenite-series (Kubo et al., 2015), with the zircon age of 118 Ma or younger (mostly 105-110 Ma; Ishihara and Orihashi, 2015) and the **MS** of 60-70*10^{-5} SI (Kanaya et al., 1973).

Research Method

We sampled granitic rocks from the eastern (sample 1) and western (sample 2) parts of the Mt. Shimizuyama body, made thin sections, and measured mineral compositions with a point counter. We then separated magmatic zircons from the two samples, measured their U-Pb isotopic ratios with the LA-ICP-MS equipped in the Graduate School of Environmental Studies, Nagoya University, and calculated the isotopic ages. We also measured the **MS** with a WSL-C magnetic susceptibility meter.

Results

Sample 1 (38°50′05.27″N, 140°47′09.69″E): It is a sample of biotite tonalite with the size of some quartz grains reducing because of dynamic recrystallization. The probability density plot of the $^{206}Pb/^{238}U$ ages of zircons had two peaks at 104 and 117 Ma. The **MS** was 153*10^{-5} SI.

Sample 2 (38°49′26.86″N, 140°45′51.33″E): It is a sample of biotite granodiorite. The probability density plot had a single peak at 109 Ma, and the concordia age of thirteen grains forming the peak was 109.1 +/- 1.2 Ma. The **MS** was 550*10^{-5} SI.

The two samples are of the magnetite-series granitic rocks, because every thin section included 10 or more grains of magnetite.

Discussion

The mineral composition of the two samples, magnetite-series, hornblende-biotite granodiorite and tonalite with few alkali feldspar crystals, is similar to that of the Kitakami granitic rocks. The magnetic susceptibility of sample 2, over 500*10^{-5} SI, falls in the range of the **MS** of the Kitakami granitic rocks. However, the **MS** of sample 1, 153*10^{-5} SI, falls between the MS of the Kitakami and Abukuma granitic rocks. The youngest peak age of the two samples, 104 and 109 Ma, are closer to the age of the Abukuma granitic rocks (105-110 Ma). The 110 Ma or older zircons in sample 1 were likely xenocryst zircons from

the Kitakami granitic rocks (127-113 Ma) or the first phase gabbro of the Abukuma granitic rocks (126-132 Ma; Kubo et al., 2015). Thus the Shimizuyama body is lithologically identical with the Kitakami granitic rocks, although the zircon age falls within the range of the Abukuma granitic rocks.
Although we could not draw a firm conclusion, we present a dataset of the oldest rock body in the Mt. Kurikoma Area Geopark. It is our great pleasure to use the dataset for the investigation of the geohistory of the Mt. Kurikoma area and Northeast Japan.

Keywords: Zircon, Geopark

