

# Zircon geochronology and geochemistry of syenites in the Yamato Mountains, East Antarctica

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The Yamato Mountains consist mainly of the granulite-facies and amphibolite-facies metamorphic rocks and intrusive syenitic rocks, and include seven massifs, called provisionally A, B, C, D, E, F and G from south to north, and associated nunataks. The syenite in the Yamato Mountains are not affected by deformation and recrystallization and then they are regarded as emplacing at the late stage of the regional metamorphism. Geochronological data for the Yamato Mountains are limited. Some K-Ar and Rb-Sr ages are reported for the syenites, granites, and metamorphic rocks (500-400 Ma). The zircon U-Pb dating of orthopyroxene biotite gneiss in Massif A shows high U overgrowth rims with 630-605 Ma, and quartz monzonite of Massif A indicates the emplacement age of  $532 \pm 8$  Ma. Granitic gneiss of Massif B shows a weighted mean  $^{206}\text{Pb}/^{238}\text{U}$  age of  $539 \pm 4$  Ma with older cores of 630-570 Ma.

In this study, two syenites (73120307 and 92110701B) and biotite-pyroxene gneiss (92111401C) collected from Massif D were analyzed by a sensitive high-resolution ion microprobe (SHRIMP-IIe) at the National Institute of Polar Research, Japan. The weighted mean  $^{206}\text{Pb}/^{238}\text{U}$  ages of 73120307 and 92110701B syenites are  $537.9 \pm 3.0$  Ma (95% conf.) and  $538.4 \pm 3.0$  Ma (95% conf.), respectively, which is consistent with the that of the quartz monzonite of Massif A. Chemical U-Pb dating of monazite in the 73120307 sample was carried out by an electron probe micro analyzer at National Institute of Polar Research. The monazite ages are scattered from 610 to 499 Ma and age peak center of a probability density is ca. 526 Ma. The zircon grains in the biotite-pyroxene gneiss show low response CL rim surrounding igneous (broad band to oscillatory) zoning core. The zircon cores suggest the igneous activity at  $625.8 \pm 4.3$  Ma. The rim shows a weighted mean  $^{206}\text{Pb}/^{238}\text{U}$  age of  $548.5 \pm 3.7$  Ma, which indicates the timing of the regional metamorphism. Further information such as other trace element concentrations will be demonstrated.